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FAB 49

EGGS & POULTRY MEAT

SELECTED FROM VOLUME **12**
FOOD SCIENCE AND TECHNOLOGY ABSTRACTS

under the direction of

Commonwealth Agricultural Bureaux, Farnham Royal, Bucks; Gesellschaft für Information und Dokumentation, Frankfurt am Main; Institute of Food Technologists, Chicago; Centrum voor Landbouwpublikaties en Landbouwdocumentatie (Pudoc), Wageningen.

INTRODUCTION

Food Annotated Bibliographies (FABs) are collections of abstracts on specific topics in food science and technology. The topics are chosen by the staff of the International Food Information Service as being of particular interest or importance. The topics normally interest individual workers, who may not require the full information provided in Food Science and Technology Abstracts, from which the abstracts for FABs are taken. The size and the cost of the FABs are controlled as much as possible with the interests of individual workers in mind.

Titles of the FABs now available are given on the back cover of this booklet. For up-to-date lists of FABs or suggestions for new topics please write to the address on the back cover. New subjects are searched for at least the five most recent volumes of Food Science and Technology Abstracts. Thereafter each FAB is updated monthly. Copies of each months abstracts on any topic may be obtained as indicated on the back cover of this publication. At the end of each volume of up-dating, the abstracts are merged and made available as a separate supplement to the original FAB.

Some of the larger FABs have been divided into sections to facilitate use. FAB 47 also has a subject and author index provided.

Copies of all original articles referred to in the abstracts may be bought (or occasionally borrowed) from the International Food Information Service. A form for ordering these is provided at the end of this FAB.

Coverage of the subject has been restricted to that of Food Science and Technology Abstracts, which covers over 1200 of the important food journals, patents from 20 countries and books published world-wide. Every effort is made to include all significant references, but editorial discretion is used on the many articles of borderline interest. If the reader particularly needs an exhaustive search of the subject, we will be pleased to provide any other references that we have available. We would, in any case, encourage readers to write or telephone us with any comments or queries that they may have.

H. BROOKES

EDITOR

1

Factors affecting the composition of meat and eggs. [Conference proceedings]

Siegel, P. B. (United States of America, Poultry Science Association) (Chairman)

Poultry Science 58 (3) 516-548 (1979) [many ref. En]

At the 67th Annual Meeting of the Poultry Science Association at Clemson University, South Carolina, USA on July 19, 1978, 6 papers were presented as part of a symposium on the nutritive, genetic and environmental or management aspects of the variations in composition of poultry meat and eggs. The papers included the following. Genetics of meat composition, by W. A. Becker. The influence of climatic and other environmental factors on performance of egg strain laying hens, by D. L. Snetsinger. These 2 papers are not published as part of the symposium, but the other 4 are reproduced in full, and are abstracted separately, being listed in the FSTA author index under United States of America, Poultry Science Association [67th Symposium]. JRR

2

Egg cooker.

Avery, R. W.

United States Patent 4 157 060 (1979) [En]

Egg cooking apparatus is described which employs means for sensing the viscosity of the egg contents as a measure of the degree of cooking. IFT

3

The effect of vitamin E, lettuce and clover upon production, fertility and hatchability of eggs from Dokki-4 pullets.

Makled, M. N.; Khattab, M. S.; Hassan, G. M.

Alexandria Journal of Agricultural Research 25 (1) 15-20 (1977) [20 ref. En, ar] [Dep. of Anim. Production, Coll. of Agric., Assiut Univ., Assiut, Egypt]

2 experiments were carried out over 3 months involving feeding Dokki-4 pullets (i) a basal diet or (ii), (i) + DL α -tocopheryl acetate supplementation, in the 1st experiment and (i), (ii), (iii), (i) + lettuce or (iv), (i) + clover in the 2nd experiment. Effects on egg quality characteristics were assessed and results show that egg wt. and total egg wt. for (ii) were not significantly different from those for (i) in the 1st experiment and that (iv) was significantly different from (i), (ii) and (iii) for egg wt. and (ii), (iii) and (iv) were significantly different from (i) for total egg wt. in the 2nd experiment. SP

4

Studies on the nutritive values of various phosphate supplements. III. Effect of feeding various phosphate supplements on egg production and egg shell quality when fed with fish meal.]

Han, I. K.; Ohh, S. J.; Kim, C. S.

Korean Journal of Animal Science 21 (2) 111-117 (1979) [25 ref. Ko, en] [Coll. of Agric., Seoul Nat. Univ., Seoul, S. Korea]

(i) Locally produced tricalcium phosphate was compared with (ii) imported dicalcium phosphate, (iii) imported (i), and (iv) bone meal, for their effect on

quality of eggs from 350 White Leghorn laying hens, 48 wk old. Diets containing (i), (ii), (iii) or (iv) were fed to the hens for 16 wk. Results for (i)-(iv) and a control, resp., were: average egg wt., 63.9, 63.0, 63.4, 64.0 and 63.0 g; average egg mass/hen-day, 41.5, 43.4, 43.1, 44.1 and 42.8 g; % shell-less eggs, 1.05, 1.25, 1.03, 1.13 and 1.15; and shell thickness (0.01 mm), 37.3, 36.7, 37.3, 37.4 and 37.0. From the results, it was concluded that the quality of (i) is comparable to that of (ii)-(iv). [From En summ.] [See following abstr. for part IV.] SP

5

[Studies on the nutritive values of various phosphate supplements. IV. Effect of feeding various phosphate supplements on egg production and egg shell quality when fed without fish meal.]

Han, I. K.; Ohh, S. J.; Kim, C. S.

Korean Journal of Animal Science 21 (2) 119-126 (1979) [26 ref. Ko, en] [Coll. of Agric., Seoul Nat. Univ., Seoul, S. Korea]

350 White Leghorn hens, 65 wk old, were fed for 5 wk with diets containing no fish meal, but supplemented with (i)-(iv) [see preceding abstr. for details]. Effects of (i) on egg quality were compared with those of (ii)-(iv). Results for (i)-(iv) and a control, resp., were: average egg wt., 66.1, 66.7, 67.1, 66.5 and 64.4 g; average egg mass/hen-day, 36.4, 37.3, 37.1, 37.6 and 34.3 g; % shell-less eggs, 3.37, 1.97, 2.65, 1.74 and 3.52; and egg shell thickness (0.01 mm), 35.88, 36.38, 35.86, 36.71 and 34.98. It was concluded from the results that there were no differences in nutritive value of (i) compared with (ii) and (iii) and that supplement of inorganic P for layers may be very important when no fish meal is supplied in laying rations. [From En summ.] [See preceding abstr. for part III.] SP

6

The effect of nutrition of the composition of eggs. [Lecture]

Naber, E. C.

Poultry Science 58 (3) 518-528 (1979) [34 ref. En] [Dep. of Poult. Sci., Ohio State Univ., Columbus, Ohio 43210, USA]

Variability in the composition of shell eggs due to the composition of the diet fed to the laying hen exists for a number of nutrients. The fat soluble vitamin content of the egg may vary considerably. While vitamin A and its carotenoid precursors may vary several fold, the liver of the hen moderates the flow of vitamin A to egg yolk. Vitamin D may vary widely and limited data suggest considerable variation in vitamin E content. The relative amounts of 18-carbon fatty acids in egg yolk lipid may vary considerably depending upon the nature of dietary fat. Cholesterol content of egg yolk may also be influenced by large amounts of dietary fat, sterols, and drugs. Among the water soluble vitamins, the vitamin B₁₂ content of the egg can vary considerably, dependent upon its level in the hen diet. Folic acid and pantothenic acid levels in the egg also vary somewhat as does the egg content of unidentified factors for growth of the newly hatched turkey poult. Content of most other water soluble vitamins shows min. variability. The I₂ and Se contents of the egg may vary considerably dependent upon diet. Fe content of the egg shows min.

variability with dietary change, while some variation is possible in other trace elements. A consideration of earlier data on shell egg composition with that obtained during the past 5 yr shows that the nutrient composition of the egg has not changed greatly in response to modern industry practices. Some variability can be expected, particularly with regard to contents of those factors mentioned above. It appears that adequate data are available for most nutrients to permit nutritional labelling of eggs and egg products. [See FSTA (1980) 12 1G22.] AS

7

Genetic variation in the chemical composition of the egg. [Lecture]

Washburn, K. W.

Poultry Science 58 (3) 529-535 (1979) [58 ref. En] [Dep. of Poultry Sci., Univ. of Georgia, Athens, Georgia 30601, USA]

Although the diet is more influential than heredity in its effect on variability of egg composition, there is some evidence for a genetic influence on the following chemical components of eggs, or of factors that might directly affect their chemical composition: relative proportion of yolk and albumen and % solids; albumen quality; qualitative protein polymorphism; total protein content; cholesterol; vitamin A, thiamin and riboflavin; fatty acids; enzymes; and deposition of metabolic products in the eggs. The variability in the composition of the shell is not considered in this review. [See FSTA (1980) 12 1G22.] AS

8

A study on the utilization of dried poultry waste as replacement for rice bran in growing pullets and layer diets.

Coligado, E. C.; Genciana, F. Y.; Palis, L. G.

Philippine Journal of Veterinary and Animal Sciences 2 (3) 172-189 (1976) [10 ref. En] [Coll. of Agric., Univ. of the Philippines, Los Banos Coll., Laguna, Philippines]

Within the framework of a study on the utilization of dried poultry waste (DPW), it was found that layer hens fed 15, 20 or 25% DPW produced more and heavier eggs than those fed rice bran diets. Egg quality, as measured by Haugh unit scores, appearance, flavour and taste, was not affected. Yolk colour was significantly more intense on 20 and 25% DPW than on otherwise similar rice bran diets. RM

9

The quantitative determination of trimethylamine in egg.

Hobson-Frohcock, A.

Journal of Food Technology 14 (4) 441-447 (1979) [25 ref. En] [ARC Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Trimethylamine (TMA), responsible for 'fishy' taint in eggs, is quantitatively determined by a freeze-drying/GLC procedure. 1-g samples of blended yolk and white are placed in a tube having a side-arm and a ground glass opening. A 'cold finger', having a ground glass stem taper is inserted into the tube to seal the top.

The sample is frozen by immersion of the tube into liquid N₂, with addition of liquid N₂ to the cold finger. Freeze-drying is accomplished by evacuating the tube through the side-arm, and maintaining it at 0.05 Torr for 2.5 h. Condensate remaining is evaporated to dryness and dissolved in 250 µl of 0.1N HCl for GLC analysis. A glass column packed with Chromosorb 103 50-60 mesh coated with 20% KOH is used. The initial 4 cm of the column was packed with 40-80 mesh soda lime to release TMA from its salt. TMA could be routinely detected at concn. $\geq 0.05 \mu\text{g/g}$ egg. The method is suitable for all foods having a moisture content high enough for freeze-drying; dried foods would require prior addition of water. DIH

10

[Pesticide residues. Analysis. Methods for extraction from non-fatty materials or from eggs.]

Colombia, Instituto Colombiano de Normas Tecnicas *Colombian Standard ICONTEC* 1233, 5pp. (1978) [Es] [Apartado Aereo 14 237, Bogota 2, Colombia]

Procedures are specified for preparation of extracts from non-fatty foods (fat content $\leq 10\%$) or from eggs. The procedures are all based on comminution or mixing of the sample as appropriate, extraction of residues into acetonitrile and purification by liquid/liquid partition into petroleum ether; for non-fatty foods, separate procedures are specified for products containing $\leq 15\%$, 15-70% and $\geq 70\%$ water. AJDW

11

[Fresh hens' eggs.]

Colombia, Instituto Colombiano de Normas Tecnicas *Colombian Standard ICONTEC* 1240, 3pp. (1978) [Es] [Apartado Aereo 14 237, Bogota 2, Colombia]

Aspects covered include: definition of the product; classification into 5 wt. grades; nomenclature; freedom from contamination; characteristics of the shell, yolk and albumen; classification of defects as 'minor' or 'serious'; tolerance for 6% eggs with serious defects and 10% with minor defects in each batch; sampling; packaging; labelling; and precautions to be taken during transport and storage of fresh eggs. AJDW

12

[Residues of veterinary drugs in foods of animal origin. Propharmacopoeia, 49th technical note.]

France, Commission Nationale de Pharmacopoe *Medecine et Nutrition* 14 (5) 353-356 (1978) [Fr] [Direction de la Pharmacie & du Med., Bureau de la Pharmacopoe, 97 Boulevard du Montparnasse, 75006 Paris, France]

This paper gives proposed tolerances for residues of various veterinary drugs in foods of animal origin (meat, offal, milk, eggs), together with recommended withdrawal periods before marketing of foods from treated animals. Drugs covered include antibiotics (oleandomycin, oxytetracycline, polymyxin B, spiramycin and tylosin), anti-parasite drugs (cambendazole, toxaphene, dichlorvos, levamisole, lindane, mebendazole, nitroxinile, oxyclozamide, parbendazole, tetramisole, and thiabendazole), hormones (trenbolone acetate, cloprostenol, oestradiol,

norgestomet, and diethylstilboestrol/dienoestrol/hexoestrol), the tranquillizer xylazine, and As and Se. AJDW

13

Methodology in the detection of salmonella in poultry products. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38]) [Lecture]

Davidson, C. M.; Cronin, F. O.
pp. 131-138 (undated) [En] [Canada Packers Research Cent., Toronto, Ontario, Canada]

Aspects considered in this survey of methods for detection of salmonella in poultry carcasses, cut-up poultry parts, and eggs and egg products include: level of sampling for required degree of accuracy; choice of sampling method; and analysis of sample (pre-enrichment, selective enrichment, plating media and biochemical and serological tests). DIH

14

[Thermoplastics film package.] Verpackung aus thermoplastischer Kunststoffolie.

Bratsch, K. (Paul Kiefel GmbH)

German Federal Republic Patent Application
2 806 201 (1979) [De]

A carton for eggs, fruit etc., consists of a conventional container with hinged lid of similar shape to the bottom, both top and bottom being pressed into a shape to accommodate 10 eggs. The novelty is in the patterns of the pressing, which serve to increase the rigidity of the structure. W&Co

15

Effect of rapeseed meal on trimethylamine metabolism in the domestic fowl in relation to egg taint.

Pearson, A. W.; Butler, E. J.; Curtis, R. F.; Fenwick, G. R.; Hobson-Frohock, A.; Land, D. G.

Journal of the Science of Food and Agriculture 30 (8) 799-804 (1979) [17 ref. En] [Houghton Poultry Res. Sta., Huntingdon, Cambs. PE17 2DA, UK]

Shaver 585 hens were classified into 2 groups, 'tainters' and 'non-tainters', on the basis of egg trimethylamine contents when fed a diet containing 10% rapeseed meal. Each class was divided into 2 groups; 1 group was then fed the rapeseed diet and the 2nd group was given an isocaloric, isonitrogenous soybean diet (control). Trimethylamine metabolism was studied by injecting hens intravenously with [14 C] trimethylamine and studying blood [14 C] trimethylamine and [14 C] trimethylamine oxide levels. Results showed that trimethylamine oxidation in 'tainters' was suppressed by feeding the rapeseed diet, and that the test described may be of use in breeding trials to remove the egg-tainting characteristic in commercial flocks. DIH

16

Nutrient values for shell, liquid/frozen, and dehydrated eggs derived by linear regression analysis and conversion factors.

Cotterill, O. J.; Glauert, J. L.

Poultry Science 58 (1) 131-134 (1979) [10 ref. En] [Dep. of Food Sci. & Nutr., Univ. of Missouri, Columbia, Missouri 65201, USA]

Linear regression analysis was used to establish estimates for each nutrient in liquid/frozen egg white, whole egg, commercial yolk, and pure yolk with solids of 12.1, 24.5, 44.0 and 51.8%, resp. These derived values were converted to both shell and dehydrated egg product bases. Also included is a simple graphic technique usable as a way to find 'best judgment' values. This method makes it possible easily to weigh the data and select the most appropriate value. This composition table is intended for use in textbooks, pamphlets, etc. AS

17

A micromethod for the screening of individual seeds and cotyledons of Brassica napus and Brassica campestris (rapeseed) for low sinapine content.

Fenwick, G. R.

Journal of the Science of Food and Agriculture 30 (7) 661-663 (1979) [14 ref. En] [ARC Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

The association of sinapine with the fishy or crabby odour present in eggs laid by certain brown egg laying hens when fed diets containing rapeseed meal indicates the desirability of removing sinapine from the original rapeseed. A method is presented whereby seeds and cotyledons of *B. napus* and *B. campestris* may be selected for low levels of sinapine. The method, based on microextraction, rapid chromatographic separation of sinapine and visual estimation of its fluorescence, allows detection of 0.025 μ g sinapine and enables 300-400 seed samples to be screened daily. AS

18

Effect of dietary mineral supplements on radius breaking strength and egg characteristics of caged layers.

Bastien, R. W.; Bradley, K. W.; Pennington, B. L.; Ferguson, T. M.

Poultry Science 58 (1) 90-92 (1979) [12 ref. En] [Dep. of Poultry Sci., Texas A&M Univ., Texas Agric. Exp. Sta., College Station, Texas 77843, USA]

6 groups of 60 caged White Leghorn hens each, housed 2/cage, were fed a basal corn-soy ration of eleven, 28-day periods, or the basal ration supplemented with reagent grade minerals as sources of K or Mg, or with single and combined supplements of 2 commercial sources of trace minerals, designated A and B. Source A supplied Fe, Cu, and Co with a small amount of choline. Supplement B provided Fe, Cu, Co, Mn, Zn, and I. Breaking strength of the radii in the group whose diet was supplemented with both A and B was significantly greater ($P \leq 0.01$) than the other treatment groups. Shell wt., shell thickness, and % shell were improved significantly when a combination of A plus B were present in the basal ration. Shell wt. and % shell were also improved when $MgSO_4$ was present. No statistically significant differences were found in hen-day production, livability or feed efficiency due to treatments. AS

19

Trimethylamine production in the caeca and small intestine as a cause of fishy taints in eggs.

March, B. E.; MacMillan, C.

Poultry Science 58 (1) 93-98 (1979) [24 ref. En] [Dep. of Poultry Sci., Univ. of British Columbia, Vancouver, V6T 1W5, Canada]

The caeca and small intestine of chickens consistently contain trimethylamine (TMA). The caecal contents in the birds studied ranged from 4 to 55 µg TMA/g and contained the higher concn. when the diet contained rapeseed meal or supplementary choline. The amounts of TMA in the small intestine were lower (1-21 µg/g) and were less influenced by dietary composition. Supplementary choline in the diet of laying birds induced the production of tainted eggs by some birds. The yolks of tainted eggs contained concn. of TMA which were consistent for each bird. TMA was also present in the follicular yolks of all sizes in the ovaries of birds which laid tainted eggs. It is postulated that, in birds laying tainted eggs, failure of the liver to oxidize TMA is responsible for deposition of TMA in egg yolk. AS

20

Salmonella control in eggs. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38]) [Lecture]

Huston, M.

pp. 103-116 (undated) [22 ref. En] [Poultry and Egg Inst. of America, Chicago, Illinois, USA]

Control of salmonella incidence in liquid egg and shell eggs in the USA is reviewed. Human salmonella outbreaks traceable to egg products are listed for the yr 1961-1977 in the USA; of 573 reported outbreaks in this period, 47 were due to egg products, with only one reported outbreak being due to eggs in the yr 1973-1977. Most outbreaks were due to the use of cracked or soiled raw shell eggs in foods that are not completely cooked, e.g. cream pies, custards, eclairs, puddings, 14 outbreaks, and ice creams, 11 outbreaks. All liquid egg used in the USA is now pasteurized and products are sampled in accordance with USDA procedures. Shell eggs are washed and sanitized prior to packaging. Cracked eggs may be sold only to processors producing a pasteurized product. An exception is allowed in the case of small producer/packers having <3000 hens, who are allowed to sell cracked eggs to household consumers. Cooking methods (i.e. min. and max. end-point temp.) for eggs and foods containing eggs are listed. If these recommended temp. are achieved, use of cracked eggs presents no danger to health; otherwise clean sound eggs should be used. DIH

21

[Studies on pasteurization and quality maintenance of egg for industrial use. III. Application of holding heat process to the pasteurization of raw liquid egg.]

Yamanaka, Y.

Japanese Journal of Dairy and Food Science [Rakuno Kagaku Shokuhin no Kenkyu] 28 (3) A121-A128 (1979) [Ja, en] [Lab. of Anim. Prod. Tech., Tokyo Univ. of Agric., Tokyo, Japan]

Studies on pasteurization of liquid egg are discussed,

with reference to data for temp. distribution in liquid egg heated under various temp./time conditions in a batch-type pasteurizer. With rapid steam heating of cold-stored liquid egg in a pasteurizer with a sanitary-type agitator, a temp. of $60 \pm 1^\circ\text{C}$ was reached in 10 min, but appreciable burn-on of the liquid egg was observed, especially at slow agitation rates. Heating with water at 100°C (to avoid burning), overall process time (for a pasteurization period of 30 min at $53-63^\circ\text{C}$) was 1.5-1.7 h; with water at 95°C , total processing time for a pasteurization time of 30 min at 55°C was 2 h. If the liquid egg was preheated to 20°C , steam heating at a temp. increase rate of $1.0-2.0^\circ\text{C/s}$ reduced process time by 30-40 min as compared to hot-water heating; no burning occurred. Steam heating at a temp. increase rate of $2.5-3.0^\circ\text{C/s}$ caused appreciable burning. Pasteurization at a temp. increase rate of $2.0-2.5^\circ\text{C/s}$ without preheating gave an increase in processing time of only 10 min as compared to the process with preheating, and caused negligible burning. A practical process was developed for pasteurization of 100-500 kg batches of liquid egg with steam heating at $2.5-3.0^\circ\text{C/s}$ in an economical batch pasteurizer with propeller-type agitator; the design of the agitator and the steam lines was improved. [From En summ.] [See FSTA (1979) 11 11Q165 for part II, and following abstr. for part IV.] AJDW

22

[Studies on pasteurization and quality maintenance of egg for industrial use. IV. Bactericidal efficiency in holding pasteurization of raw liquid egg and changes of bacterial population during frozen storage thereafter.]

Yamanaka, Y.; Nonami, Y.

Japanese Journal of Dairy and Food Science [Rakuno Kagaku Shokuhin no Kenkyu] 28 (3) A129-A135 (1979) [Ja, en] [Dep. of Anim. Sci., Tokyo Univ. of Agric., Tokyo, Japan]

Studies on the bactericidal efficiency of pasteurization of liquid egg in batch-type pasteurizers with sanitary-type or propeller-type agitators are described. Data are given for the direct microscopic count, plate count, coliform count, pH and viscosity of raw and thawed liquid egg, liquid egg samples immediately after heat treatment, and heat-treated liquid egg after frozen storage for ≤ 6 months. Bactericidal activity of processes with a propeller-type agitator was low for all heating regimes studied; coliforms may survive pasteurization for 30 min at $55-60^\circ\text{C}$. Standard plate counts and coliform counts were positive in some samples even after frozen storage for 3-4 months. This low bactericidal efficiency may be due to inadequate agitation. With a sanitary-type agitator, satisfactory bactericidal efficiency was achieved with holding at 57°C for 30 min; the product retained good quality during subsequent frozen storage. The bactericidal efficiency was lower for frozen/thawed than for non-frozen liquid egg. Plate counts and coliform counts tended to decrease during frozen storage; viscosity of liquid egg increased as a result of pasteurization and frozen storage. [See preceding abstr. for part III and following abstr. for part V.] AJDW

23

[Studies on pasteurization and quality maintenance of egg for industrial use. V. Holding pasteurization efficiency of contaminated raw liquid egg and the changes of bacterial population during frozen storage thereafter.]

Yamanaka, Y.; Nonami, Y.

Japanese Journal of Dairy and Food Science [Rakuno Kagaku Shokuhin no Kenkyu] 28 (4) A153-A160

(1979) [10 ref. Ja, en] [Dep. of Anim. Sci., Tokyo Univ. of Agric., Tokyo, Japan]

Studies on the bactericidal efficiency of pasteurization of contaminated frozen/thawed and non-frozen liquid egg in a batch pasteurizer with a sanitary-type agitator are described. Tables of data are given showing temp. distribution, direct microscopic count, plate count, coliform count, pH and viscosity of liquid egg samples subjected to various pasteurization regimes. Surface temp. of the raw egg was lower than the temp. of the main bulk of the liquid; headspace temp. was also lower than liquid temp. Pasteurization at 50°C for 30 min did not give adequate bactericidal efficiency; pasteurization at 63°C for 30 min gave good bactericidal efficiency, but caused burning and changes in viscosity. Pasteurization at 57°C for 30 min gave satisfactory bactericidal efficiency, without burning or appreciable changes in viscosity. Changes in pH and viscosity increased with increasing severity of pasteurization conditions. [From En summ.] [See preceding abstr. for part IV and following abstr. for part VI.] AJDW

24

[Studies on pasteurization and quality maintenance of egg for industrial use. VI. The quality of pasteurized and frozen whole egg.]

Ebara, H.; Yamanaka, Y.; Nonami, Y.

Japanese Journal of Dairy and Food Science [Rakuno Kagaku Shokuhin no Kenkyu] 28 (4) A161-A167

(1979) [11 ref. Ja, en] [Dep. of Anim. Sci., Tokyo Univ. of Agric., Tokyo, Japan]

Comparative studies were conducted on the functional properties of (i) frozen liquid egg (imported from New Zealand), (ii) raw liquid egg, (iii) frozen liquid egg pasteurized before homogenization, (iv) frozen liquid egg pasteurized after homogenization and (v) frozen liquid egg pasteurized after filtration. Tables of data are given for various quality characteristics of Kasutera (a type of cake), custard pudding, cream puffs and sponge cakes made with (i)-(v). The relative merits of products made with the various whole egg products are discussed. Whipping ability of whole egg was impaired by homogenization, especially treatment (iv), which resulted in quality defects in bakery products. This impairment of whipping ability is probably due to effects of homogenization on the structure of the oil phase of the egg yolk. Overall quality of most products made with (ii)-(v) was, however, generally equal or superior to that of products made with (i). [From En summ.] [See preceding abstr. for part V.] AJDW

25

[Egg preservation.]

Kanto Denka Kogyo Co. Ltd.

Japanese Examined Patent 5 410 621 (1979) [Ja]

Eggs are preserved by coating the shells with an emulsion of vinylidene chloride resin. IFT

26

Ovoid yolk hard cooked eggs.

Warren, W.

United States Patent 4 161 548 (1979) [En]

A process is described in which an egg is soft boiled to form a layer of hard cooked egg white adjacent the shell, after which the uncooked internal liquid is mixed and the cooking completed. IFT

27

Polychlorinated biphenyls (PCB's); reduction of tolerances.

United States of America, Food & Drug Administration

Federal Register 44 (127, June 29) 38330-38340 (1979) [En] [Washington, DC, USA]

Balancing adequate public health protection against excessive loss of food, the FDA is reducing the tolerances for unavoidable residues of PCB as follows (p.p.m.): milk and dairy products, from 2.5 to 1.5 (fat basis); poultry, from 5 to 3 (fat basis); eggs, from 0.5 to 0.3; and fish and shell fish, from 5 to 2. CAS

28

Residues of cadmium in edible tissues or products of lactating cows, swine and layer hens after low-level dietary exposures.

Street, J. C.; Sharma, R. P.; Shupe, J. L.; Wagstaff, D. J.

Toxicology and Applied Pharmacology 45 (1) 305 (1978) [En] [Utah State Univ., Logan, Utah, USA]

Cows and pigs were fed diets containing CdCl₂ (added to diets to give Cd levels approx. 2 and 10 p.p.m. above the normal dietary intake) for 3 months; some of the animals were subsequently fed a control diet to allow Cd depletion from the body. Laying hens were similarly treated but with a 6 wk treatment period followed by a 6 wk depletion period. Cd levels were determined in skeletal muscle, liver, kidney and bone of all animals, in eggs and in cows' milk. Milk and eggs showed no increases in Cd concn. during the treatment and depletion periods. Muscle samples also showed no consistent effect of Cd treatment. Consistent dose-time related increases of Cd were observed in livers and kidneys of all animals; the depletion periods resulted in no decrease in Cd contents of these organs. JA

29

Metabolism of [¹⁴C]mibolerone in the chicken.

Dunn, G. H.; Krzeminski, L. F.; Gosline, R. E.; Subacz, C. J.

Journal of Agricultural and Food Chemistry 27 (5) 1001-1006 (1979) [12 ref. En] [Biochem. & Residue Analysis, Agric. Div., Upjohn Co., Kalamazoo, Michigan 49001, USA]

1-day old White Rock chicks were fed a diet containing 1.5 µg unlabelled mibolerone (an androgen analogue preventing avian lymphoid leukosis)/g feed until 21 days of age, then fed a diet containing [^{14}C]mibolerone (1.6 µg/g) from 21 to 49 days of age. Birds were then transferred to a control diet (no mibolerone) and slaughtered at intervals to measure tissue residue depletion rates. Some birds were used for egg production. Highest tissue levels of [^{14}C] 1 h after last radioactive dose were in bursa (308.3 parts/billion mibolerone equivalents) and liver (94.4 parts/billion); red and white muscle levels were 3.3 and <0.5 parts/billion, resp. All residue levels were <0.5 parts/billion (level of detection) 21 days post-treatment. No residues were detectable in eggs. DIH

30

Fish scales: a coagulating aid for the recovery of food processing wastewater colloids.

Welsh, F. W.; Zall, R. R.

Process Biochemistry 14 (8) 23-25, 27 (1979) [18 ref. En][Dep. of Food Sci., Cornell Univ., Ithaca, New York, 14853, USA]

Restrictions on waste discharge by seafood processors have led to development of by-product recovery techniques. Scales from carp and porgy were investigated as a source of coagulating agents. Scales were dehydrated, milled and dispersed as 0.01% suspensions in water for use. Scales were then tested for turbidity reduction in (i) egg washing water, (ii) scallop shucking water, and (iii) fruit juice processing wastewater. Turbidity reduction and zeta potential analysis were studied to determine optimum addition rates of scale suspensions to wastewaters, which were for carp and porgy scales, resp. (mg solids/l): (i) 60, 60, (ii) 15, 25 and (iii) 25, 15. Effects of COD, total Kjeldahl N, TS, ash, suspended solids (SS) and turbidity for (i)-(iii) are tabulated for acidification + fish scales and acidification alone. Both types of scale preparation could remove 53.0-96.5% SS, with reductions in other parameters, depending on the nature of wastewater. Reductions in COD for acidification + fish scales (carp or porgy, resp.) were (%), (i) 68.0, 79.0, (ii) 61.8, 48.0, (iii) 31.3, 21.3. Wastewaters containing colloidal materials are more suitable for treatment than, e.g. (iii) which contain dissolved carbohydrate, which is not removed by fish scale treatment. DIH

31

[Chlorophenols in wood shavings and mustiness of poultry and eggs.]

Steeverink, A. T. G.; Jansen, J.

Voedingsmiddelentechnologie 12 (14) 24-27 (1979) [22 ref. Nl, en][Inst. voor Pluimveeonderzoek 'het Spelderholt', Beekbergen, Netherlands]

Problems with musty off-odours in eggs and poultry carcasses, attributable to chloroanisoles (derived from chlorophenols used as wood treatment agents) are discussed with reference to literature data. 32 samples of wood shavings were analysed for 2,4,6-trichlorophenol, 2,3,4,6-tetrachlorophenol and pentachlorophenols by GLC; a table of results is given. The results show that only 25% of samples had

chlorophenol concn. below the critical level of 5 p.p.m. The incidence of 'musty' off-flavours is not as high as this result would suggest; possible reasons for this difference are discussed, especially losses of chloroanisoles by evaporation. Measures for minimization of the problem are discussed briefly. AJDW

32

Preliminary investigation on the nutritive value of krill meal in the feed of broiler chickens and laying hens.

Rys, R.; Koreleski, J.

Archiv für Tierernährung 29 (3) 181-188 (1979) [10 ref. En, de, ru][Dep. of Anim. Nutr., Inst. of Zootechnics, Krakow, Poland]

650 broiler chicks were used in a study on effects of substitution of krill meal for fish meal or fish meal + dried skim milk in the diet on performance and carcass quality. The broilers were slaughtered at 56 days of age. Tables of results are given. No significant effect of krill meal on dressing %, thigh meat % and internal fat % was observed; brisket meat % varied irregularly among treatments, although the control diet gave the highest % brisket meat. 22 laying hens were used in a 6 month feeding trial on effects of diets with 3% fish meal or 3% krill meal on laying performance and egg quality. The krill meal diet decreased egg wt., but increased colour intensity and vitamin A content of the yolk. No effect on the flavour of the eggs was observed. High levels of krill meal in the diet altered the fatty acid composition of the internal fat of hens, tending to increase the myristic acid concn. and decrease the stearic and oleic acid concn. AJDW

33

Antibiotics and sulphonamides.

Hamann, J.; Tolle, A.; Heeschen, W.

Bulletin, International Dairy Federation No. 113, 43-56 (1979) [127 ref. En]

The chemical structure and mechanism of action of the most important antibiotics, and the sulphonamides, are discussed. Their metabolism and excretion in milk are considered and the principles of residue analysis dealt with. These residues cause problems in manufacture of dairy products and may have an effect on the milk consumer. Acceptable levels of residues (FAO/WHO, 1969) in mg/kg moist substance in meat, milk and eggs resp. are as follows: streptomycin, 1.00, 0.2 and 0.5; penicillin, 0.06, 0.006 and 0.018; tetracycline, 0.6, 0.1 and 0.3; chlortetracycline, 0.05, 0.02 and 0.05; and oxytetracycline, 0.25, 0.1 and 0.3. For chloramphenicol a limit of zero is laid down for reasons of toxicity. JMa

34

[Egg quality in hens of different lines and their crosses.]

Burdashkina, V. N.

Doklady TSKhA [Sel'skokhozyaistvennaya Akademiya imeni K. A. Timiryazeva] No. 220, 136-141 (1976) [Ru][Moskovskaya Sel'skokhoz. Akad. imeni K. A. Timiryazeva, Moscow, USSR]

Batches of 50 eggs collected from groups of (i) Leghorn line 63 (German origin), (ii) Leghorn R line (Japanese origin), (iii) Poltava P37 (domestic) and their (iv), (i) × (ii), (v), (ii) × (i), (vi), (ii) × (iii), and (vii), (iii) × (ii) crosses when 7 and 12 months of age were analysed. Mean values with s.e. are tabulated for wt, sp. gr. and shape index of eggs, egg white and egg yolk indices, egg white consistency (Haugh units) and incidences of meat and blood spots. Among the main conclusions were that egg sp. gr. and white quality diminished with increase in hen age; that (v) showed at 7 months heterosis for egg wt. and egg protein quality; and that at 12 months, paternal effects predominated for egg white quality. SKK

35

[Effect of protein level in compound ration on egg quality of pure-bred and hybrid hens.]

Zavgorodnyaya, M. P.; Bashilova, L. P.

Doklady TSKhA [Sel'skokhozyaistvennaya]

Akademiya imeni K. A. Timiryazeva No. 220, 131–135 (1976) [Ru] [Moskovskaya Sel'skokhoz. Akad. imeni K. A. Timiryazeva, Moscow, USSR]

Matched groups of 14 (i), Leghorn line C, (ii), Leghorn line D, (iii), Moscow line C, and (iv), (iii) × (i) cross layers received from 140 days of age a compound ration containing 17% protein (controls), while analogous (i)–(iv) groups received a compound ration containing 19% protein. Mean values for 1-yr lay are tabulated for egg white and egg yolk indices, shell thickness, incidence of eggs with shell damage, and DM contents of white and yolk determined for 10-egg batches collected from each group on the 3rd, 6th, 9th and 12th months of lay of each group; and values for contents of carotenoids and vitamin A are tabulated for the groups when they were 270-, 330-, and 510-days old. The overall conclusions were that eggs of (i), (ii) and (iv) controls showed higher white and yolk indices and white and yolk DM contents than corresponding groups in the 19% protein ration, but that (iii) did not show this difference; that (i) and (iv) controls had less carotenoids and vitamin A, and (ii) and (iii) controls had more than the corresponding groups on 19% protein; and that (iv) had the best overall egg quality characteristics. SKK

36

Effect of calcium levels, appetite enhancers and endoparasites on egg shell quality and performance of laying hens.

Husseini, M. D.

Dissertation Abstracts International, B 39 (11) 5157: Order no. 79-09207, 105pp. (1979) [En] [Texas A&M Univ., College Station, Texas 77843, USA]

White leghorn-type pullets (age 20 wk) were housed either 1 or 2 birds/cage and fed a basic diet containing either 2.5 or 3.5% Ca for twelve 28-day egg production periods. No statistically significant differences were found between the 2 Ca levels for most egg production and shell characteristics. However, eggs from birds fed 3.5% Ca and housed 2/cage had higher sp. gr. than those of birds fed 2.5% Ca and housed 1/cage. Egg shell stain scores indicated that best shell quality was achieved with birds fed 3.5% Ca and housed 1/cage. In another experiment, pullets exposed to *Ascaridia galli*

and *Heterakis gallinarum* during rearing were treated with piperazine or hygromycin during growth and the first 12 wk of the egg production cycle; starting at the beginning of the sixth 28-day egg production period and continuing for 7 periods, studies were made of the effects of feeding 2.5 or 3.5% Ca, oyster shell and an appetite enhancer. Hens fed 3.5% Ca consistently had higher egg and shell wt, thicker shells and higher egg sp. gr. Hens receiving the appetite enhancer had low values for albumen height, shell wt. and thickness, egg shell stain scores and egg sp. gr. Another experiment indicated that 8-wk old birds fed 0.5% NaCl in the pre-lay grower diet produced a higher incidence of soft-shelled eggs than birds receiving no additional NaCl. JA

37

[Detection of chloramphenicol residues in eggs.]

Karkocha, L.

Roczniki Panstwowego Zakladu Higieny 30 (1) 43–45 (1979) [4 ref. Pl, en] [Zaklad Badania Zywnosci i Przedmiotow Uzytku Panstwowego Zakladu Higieny, Warsaw, Poland]

Egg samples of 50 g were homogenized and extracted 3 × using 50 ml ethyl acetate for each extraction, deproteinizing them at the same time by addition of 3 ml 5N HCl. Acetate extracts were concentrated until ethyl acetate vapours disappeared. A mixture of acetonitrile with water (6 + 1) was added to the residue and shaken with petroleum ether. The defatted extracts were evaporated dryness dissolved in absolute ethanol and placed as a whole on chromatographic plates covered with silica gel G (Merck). The chromatogram was developed in a chloroform-methanol-25% ammonia solution system (90 + 9 + 1.5) and was sprayed with a solution of stannous chloride and then with a solution of *p*-dimethylaminobenzoic aldehyde. The method detected 0.01 mg chloramphenicol in 1 kg egg mass. AS

38

[Detection of sulphaquinoxaline residues in eggs.]

Rutczynska-Skonieczna, E. M.

Roczniki Panstwowego Zakladu Higieny 30 (2) 137–140 (1979) [3 ref. Pl, en] [Zaklad Badania Zywnosci i Przedmiotow Uzytku Panstwowego Zakladu Higieny, Warsaw, Poland]

Detection of sulphaquinoxaline (SQ) in eggs by TLC is described. Deproteinization of samples and extraction of the compound were done with a mixture of 30% trichloroacetic acid and 5N HCl. The extract was purified with ethyl ether, ether residues were removed in an N₂ stream, and after alkalization to pH 9, SQ was extracted with ethyl acetate saturated with water. The acetate extract, dried with anhydrous Na₂SO₄, was concentrated to dryness in an N₂ stream, and the dry residue was dissolved in methanol and placed on a plate covered with a suspension of silica gel G in redistilled water. The chromatogram was developed in a mixture of n-hexane/acetone, 1:1 ratio. The plate was sprayed with a recently prepared 1% solution of NaNO₂ in 1N HCl, and after drying for 5 min at 100°C it was sprayed with a 0.2% solution of β-naphthol in 0.1N NaOH. In the presence of SQ, orange-red spots appeared. The method made possible detection of 0.25 mg SQ/kg egg mass. AS

39

[Lactic acid fermentation of whole egg. II. Changes in egg proteins and free amino acid content during sterilization and lactic acid fermentation.]

Katamine, S.; Mamiya, Y.; Sekimoto, K.; Furukawa, N.; Yamanaka, Y.

Journal of Japanese Society of Food Science and Technology [Nippon Shokuhin Kogyo Gakkaishi] 25 (6) 311–317 (1978) [19 ref. Ja, en] [Res. Cent., Nihon Nosan Kogyo Co. Ltd., Daimura-cho, Midoriku, Yokohama, Japan]

Whole egg, with and without 1% added glucose, was sterilized, and then incubated at 37°C after inoculating with resting cells of *Lactobacillus acidophilus* L 54. Viable cell count of whole egg with added glucose was $3 \times$, and titratable acidity $5 \times$, that without added glucose after 20 h fermentation. Changes in polyacrylamide gel electrophoresis patterns were mostly caused by irreversible acid denaturation of egg protein at the low pH (4.0). Lysozyme activity of whole egg was reduced by sterilization, but then remained unchanged during fermentation for 72 h. Total amounts of free amino acids were hardly affected by sterilization and fermentation; threonine concn. gradually decreased during fermentation, but concn. of other free amino acids were unchanged. [From En summ.] HBr

40

[Present position and prospects of designing and manufacturing egg processing equipment.]

Khabatov, B. Sh.

Doklady TSKhA [Sel'skokhozyaistvennaya Akademiya imeni K. A. Timiryazeva] No. 220, 142–146 (1976) [Ru] [Moskovskaya Sel'skokhoz. Akad. imeni K. A. Timiryazeva, Moscow, USSR]

The existing Soviet egg-grading machines, YaS-1 and MSYa-1M have throughputs of 4200 and 9000 eggs/h and require 1.62 and 0.76 man-h/1000 eggs, resp.; corresponding data for the M-4 and YaH-3000 M egg-washing machines are 1500 and 2440 eggs/h and 2.3 and 1.8 man-h/1000 eggs. Characteristics of 2 British, 3 USA, 1 Netherlands and 1 Federal German egg-processing machines with throughputs in the 10 800–43 200 eggs/h range are briefly presented, and it is pointed out that they are superior in several respects to domestic machines. Development in the USSR of high-productivity lines incorporating pneumatic and electronic automation is outlined; and production of such an experimental line for 20 000 eggs/h is set for 1976. SKK

41

Effect of oiling variables on storage of shell eggs at elevated temperatures.

Heath, J. L.; Owens, S. L.

Poultry Science 57 (4) 930–936 (1978) [20 ref. En] [Dep. of Poultry Sci., Univ. of Maryland, College Park, Maryland 20742, USA]

Trials were conducted to evaluate effects of egg temp. (12°, 22° or 32°C), oil temp. (12°, 22° or 32°C), storage temp. (12°, 22° or 32°C), shell temp. (32°, 52° or 72°C for 5 min) resulting from washing before oiling, delay before oiling (3, 9, 27 or 81 h at 32°C); and

exposure to CO₂ pressure (1.1, 1.4 and 1.8 kg/cm² for 5 s–8 min) on the quality of oiled eggs. Storage temp. before oiling was the main factor influencing storage life. Oil temp. and egg temp. had little effect on egg quality during storage for 4 wk. Storage temp. was the main factor influencing egg grade. Preheating of eggs before oiling did not affect quality or storage life. Oiling immediately after lay gives the best internal quality, but is not necessary for maintenance of grade A quality for 4 wk even under extreme temp. conditions. Treatment of eggs under CO₂ pressure had little effect on interior quality. AJDW

42

Phosphorus metabolism in the laying hen with respect to egg shell formation.

Choi, J. H.

Dissertation Abstracts International, B 39 (10) 4662: Order no. 79-07730, 86pp. (1979) [En] [Univ. of Florida, Gainesville, Florida 32601, USA]

Studies on the relation of P metabolism to Ca and P level in the diet and to egg shell formation are discussed; the results show that low dietary Ca levels and/or high dietary P levels decreased the sp. gr. of eggs (and index of shell thickness). Differences in dietary P supply at different times of day influenced egg sp. gr., suggesting that P requirements differ between stages of the laying cycle. AJDW

43

[A study on crossbreeding for egg production.]

Ohh, B. K.; Yeo, J. S.

Korean Journal of Animal Science 21 (4) 389–393 (1979) [9 ref. Ko, en] [Coll. of Agric., Seoul Nat. Univ., Seoul, S. Korea]

Combining ability and genetic sources of 5 purebred strains of hens were identified by crossbreeding them. Additive effects were in general found to be the most important for egg wt. [From En summ.] SP

44

The photoperiodic and ahemeral light-dark cycle effect on White Leghorn layers.

Yassin, O. E.

Dissertation Abstracts International, B 39 (10) 4661: Order no. 79-06945, 212pp. (1979) [En] [Univ. of Missouri, Columbia, Missouri 65201, USA]

180 Leghorn hens were used in a 207 day study on effects of lighting regime and 'day' length on egg production and quality. Lighting regimes comprised 14 h light period throughout, 14 h increasing to 16 h and 14 h increasing to 18 h (in evenly-spaced 15 min increments), applied with 23 h or 24 h total light + dark cycles (LDC). Data was obtained on egg production, egg wt., sp. gr., shell thickness, Haugh score, and yolk wt. LDC significantly influenced sp. gr., yolk wt. and Haugh score; photoperiod did not significantly influence egg quality. LDC \times photoperiod interaction was significant for all variables studied except Haugh score. Further trials were conducted using 260 White Leghorn pullets of a Univ. of Missouri strain (UM) and 40 White Leghorn pullets of a commercial strain (C). Treatments were: LDC 27 h reducing to 23 h; LDC 22 h

increasing to 23 h; and a 24 h LDC control. All had light periods of 13 h increasing to 15 h. The 2 strains differed for all egg quality variables. Long LDC increased egg wt., sp. gr., shell wt. and shell thickness. Long LDC increased Haugh score for strain C, but reduced it for strain UM. Strain \times LDC interaction was significant for Haugh score. For UM, Haugh score decreased with increasing photoperiod. AJDW

45

Extraction, cleanup, and quantitative determination of aflatoxins B₁ and M₁ in beef liver.

Trucksess, M. W.; Stoloff, L.

Journal of the Association of Official Analytical Chemists 62 (5) 1080-1082 (1979) [5 ref. En] [FDA, Div. of Food Tech., Washington, DC 20204, USA]

A method for detn. of aflatoxin B₁ in eggs was applicable for aflatoxin B₁ in liver, but ineffective for aflatoxin M₁ in liver because of poor recovery of added aflatoxin and interferences in TLC. The method was modified by the addition of citric acid to the extracting solvent and ammonium sulphate to the extract solution for removing protein. The elution system for silica gel column cleanup was also changed by substituting methanol for acetone, and adding a step for confirmation of aflatoxin M₁ identity. The method has been used successfully for survey and research on aflatoxin residues in animal tissues. AS

46

[Restricted feeding during pullet growth.] Zur Frage der restriktiven Fütterung während der Junghennenzeit. Scholtyssek, S.

Archiv für Geflügelkunde 43 (2) 61-68 (1979) [13 ref. De, en, fr, ru] [Lehrstuhl Kleintierzucht, Univ. Hohenheim, Garbenstrasse 17, 7000 Stuttgart 70, Federal Republic of Germany]

2400 pullets were used in a 3-factorial trial conducted to evaluate effects of hen hybrid (Hisex, Shaver or LSL), dietary protein level (14 vs. 17%) and level of feeding (ad lib. vs. 80% of ad lib.) on growth, laying performance and egg quality. Tables of results are given, including values for egg wt., breaking strength, elastic deformation of the shell, yolk colour, albumen height and yolk index. The results reveal that only hen strain significantly affected the egg quality characteristics; dietary protein concn. and level of feeding had only small effects. AJDW

47

Identification of nosiheptide in feeds and detection of residues in animal tissues.

Pascal, C.; Gaillard, C.; Moreau, M.-O.

Journal of the Association of Official Analytical Chemists 62 (5) 976-981 (1979) [9 ref. En] [Rhone-Poulenc Ind., Res. Cent., 9 Quai Jules Guesde, 94400, Vitry-sur-Seine, France]

Methods are described for detn. of the antibiotic nosiheptide, used as a livestock growth promoter, in fermentation broths, in feed and in animal tissues. Nosiheptide residues in animal tissues are extracted by dimethylformamide/acetone, and an aqueous dilution of the extract is poured into wells in an agar gel seeded with *Staphylococcus aureus* for microbiological

diffusion assay. Recoveries of nosiheptide from fortified samples of pig muscle, liver, kidney and back fat, and chicken muscle, liver, kidney, fat and eggs, were approx. 100%. Sensitivity of the assay is 0.025 p.p.m. DIH

48

[Control methods and evaluation of residues in animal products.]

Janicek, J.

Prumysl Potravin 30 (4) 231-233 (1979) [Cs] [Statni Vet. Sprava Min. Zemedelstvi a Vyzivy CSR, Prague, Czechoslovakia]

At present > 400 preparations for the protection of crops are permitted for use in Czechoslovakia, and > 13 000 t active substances, including > 8000 t weed killers, are used annually. Some results of tests on the presence of chlorinated and organophosphorus pesticides in fodder and in milk are given. Hexachlorobenzene incidence in foods (0.015-0.5 mg/kg in milk; 0.18-0.7 mg/kg in cheese) was a major problem. Antibiotics were detected in 1.04% of 481 milk samples tested by a veterinary institute, and were also found in meat samples from emergency slaughters, and in a small proportion (0.3%) of eggs. FL

49

Aflatoxin in the southeastern United States: was 1977 exceptional?

Cobb, W. Y.

Association of Food and Drug Officials, Quarterly Bulletin 43 (2) 99-107 (1979) [1 ref. En] [Food & Drug Protection Div., N. Carolina Dep. of Agric, Raleigh, N. Carolina 27611, USA]

The regulatory action taken in 1977 as a result of detection of elevated aflatoxin levels in maize and maize products in North Carolina, USA are described. Levels of aflatoxins in other foods (market milk, meat and eggs) were also monitored. Of 302 milk samples, 19 exceeded the 0.5 parts/10⁹ action guideline. Meat and eggs were not significantly affected by aflatoxin contamination. JRR

50

[Biokinetic studies with the herbicide monolinuron in laying hens.] Biokinetische Untersuchungen mit dem Herbizid Monolinuron bei der Legehennen.

Hilbig, V.; Lucas, K.; Westphal, D.; Münchow, H.

Archiv für Geflügelkunde 43 (2) 86-92 (1979) [12 ref. De, en, fr, ru] [Inst. für Veterinärmed. des Bundesgesundheitsamts, Postfach, 1000 Berlin 33]

46 White hybrid laying hens were used in a study on the kinetics and biotransformations of dietary monolinuron (ML). The hens received ¹⁴C-labelled ML at levels of 0.25 or 25.0 mg/kg live wt., either once or daily for 16 days. Residues of ML and its metabolites were determined in faeces, urine, various tissues and eggs. Tables and graphs of results are given. 87% of dietary ML was excreted in faeces and urine within 96 h of oral administration. Organs (including blood and bile) contained only approx. 1% of the administered dose. ML residue concn. in muscle tissue were negligible. After a single dose of 0.25 mg ML/kg live wt., egg yolk

contained 1.82% and egg white 0.31% of the administered ML; corresponding values for a single dose of 25 mg ML/kg live wt. were 3.72% and 0.53%. resp. ML residue concn. in egg yolk and egg white increased to a max. after ML administration for 6-7 days and 3-4 days, resp., remained at this level until cessation of ML administration, then decreased slowly to O (more slowly for egg yolk than for egg white). AJDW

51

[Effects of beryllium compounds on hens.

II. Distribution of ^7Be in the organism.] Die Wirkungen von Beryllium-Verbindungen auf das Huhn. II. Die Verteilung von Radio-Beryllium im Organismus. Lesur, E.; Hatjipanagiotou, A.; Hardebeck, H.; Krampitz, G.

Archiv für Geflügelkunde 43 (1) 1-5 (1979) [4 ref. De, en, fr, ru] [Inst. für Anatomie, Physiologie & Hygiene der Haustiere, Univ. Bonn, Federal Republic of Germany]

Groups of HNL hybrid hens (16 months of age) were used in studies on distribution of ^7Be in tissues after oral administration of $^7\text{BeCl}_2$ at a dose of 5 $\mu\text{Ci/day}$ for 7 days, or intravenous treatment with $^7\text{BeCl}_2$ at a dose of 15 $\mu\text{Ci/day}$ for 2 days. Hens were slaughtered 1 day after the end of oral application of ^7Be , and 7 days after the end of intravenous treatment with ^7Be . Tables of results are given for counts/min g DM for various tissues, and for eggs. Results for oral administration show the greatest ^7Be accumulation to occur in pancreas, intestines and feathers; counts/min g of muscle DM were little above background level. Results for intravenous application of ^7Be show the greatest accumulation to occur in the ovary and bones, followed by liver; accumulation in muscle tissue was low. Egg yolk accumulated large amounts of ^7Be ; egg white and shell accumulated very little. AJDW

52

[Printing ink composition.]

Hitachi Co. Ltd.

Japanese Examined Patent 5 422 337 (1979) [Ja]

Jet printing ink composition for use on foods, such as fruits or eggs, is described which incorporates a water-soluble red dye in an aqueous alkaline solution, a shellac binder and a morpholine fatty acid salt. IFT

53

Determination of leptophos residues in poultry.

Tantawy, G.; Othman, M. A. S.; Abou-Donia, M. B.; Marei, A. S.; Khalil, A. Z.

Alexandria Journal of Agricultural Research 26 (3) 721-730 (1978) [12 ref. En, ar] [Dep. of Plant Protection, Fac. of Agric., Univ. of Alexandria, Alexandria, Egypt]

Residual leptophos, its O-analogue and its phenolic decomposition product were determined in body tissues, egg yolk and egg white of hens given a single oral dose of 200 mg/kg, 1 to 17 days prior to slaughter or collection. Levels of the parent compound in breast and thigh muscles reached max. of 4.12 and 2.86 p.p.m., resp. 9 days after administration, while levels in depot fat reached a max. of 1.72 p.p.m. after 5 days. Residues

of leptophos and its metabolites in egg contents reached a peak at the fifth day after administration, at 7.31, 16.81 and 23.98 p.p.m. for the phenolic product, the O-analogue and leptophos itself, resp. in egg yolk, and 28.95 p.p.m. leptophos in egg white. JRR

54

[Effects of treatment with various hormones and pregnant women's urine on egg laying and meat production of two-year-old hens.]

Kim, S. K.; Lee, K. D.; Lee, D. S.

Korean Journal of Animal Science 21 (4) 307-319 (1979) [44 ref. Ko, en] [Taejon Vocational Col., Taejon, S. Korea]

2-yr old hens were treated with (i) pregnant mare serum gonadotrophin, (ii) human chorionic gonadotrophin, (iii) thyroxin, (iv) tapazole, (v) oestrogen, (vi) progesterone and (vii) pregnant women's urine and effects of (i)-(vii) on egg and meat quality were studied in comparison with (viii) a control. Results are tabulated and show there was no significant difference between treatments for egg wt. There was no significant difference between (i), (v), (vii) and (viii) for yolk number, but (ii) (iii), (iv) and (vi) were significantly different ($P < 0.01$) from each other and all other treatments. A significant difference ($P < 0.05$) was noted in carcass wt. among the treated groups and the carcass wt. of (i), (ii), (iv), (v) and (vii) was higher than of (viii). The carcass % of (i) and (iv) was significantly higher than that of (viii), there was no significant difference between (ii), (iii), (v), (vi), (vii) and (viii). The water extractives, moisture and ash contents of meat were not affected by the treatments, however crude protein content of meat was slightly lower in (iii) and (iv) and slightly higher in (i), (v) and (vi) compared to (viii) and crude fat content was higher in (iv) than (viii). Heart and liver wt. of (i)-(viii) were in proportion to body wt. [From En summ.] SP

55

Examination of corn dried steep liquor concentrate and various feed additives as potential sources of a Haugh unit-improvement factor for laying hens.

Waldroup, P. W.; Hazen, K. R.

Poultry Science 58 (3) 580-586 (1979) [12 ref. En] [Dep. of Anim. Sci., Univ. of Arkansas, Fayetteville, Arkansas 72701, USA]

Dried steep liquor concentrate (DSLCL), a blend of fractions from the wet milling of corn, resulted in significant improvements in interior egg quality expressed as Haugh units in 3 experiments. The addition of ascorbic acid at 0.25% resulted in significant Haugh unit improvement in 2 of 3 experiments, but ascorbic acid analysis of diets containing DSLCL suggests that this vitamin is not a component of the factor in DSLCL responsible for improved Haugh units. Other factors in which DSLCL is nutritionally potent such as lactic acid, inositol, biotin, and glutamic acid do not appear to have any influence on interior egg quality. AS

56

Effects of different short-term dietary phosphorus levels on egg specific gravity and blood phosphorus of hens.

Choi, J. H.; Miles, R. D.; Harms, R. H.
Poultry Science 58 (1) 99-103 (1979) [18 ref. En] [Dep. of Poultry Sci., Florida Agric. Exp. Sta., Gainesville, Florida 32611, USA]

In 2 experiments, laying hens were fed a diet containing 0.3% P for a preliminary period of 3 days. At the beginning of the experimental period, hens were fed 0.3, 0.75 or 1.4% P with 3.5% Ca. Another group was fed 0.75% P and 1.4% Ca. Sp. gr. of the eggs and blood serum inorganic P were determined and compared with controls (continuous diet 0.75% P and 3.5% Ca). Both high P and/or low Ca decreased the sp. gr. of eggs. In a further experiment, hens were fed different levels of P at different times of the day. Birds receiving 1.4% P between 0700 and 0930 h and 0.3% P between 0930 and 2000 h laid eggs with higher sp. gr. than hens for which the P concn. in these periods were reversed. Egg shell quality was not improved beyond that from hens fed 0.75% P for both time periods. Both experiments demonstrated that dietary P level affected egg shell quality. AS

57

Available phosphorus in poultry. I. Effect of phosphorus levels on the performance of laying hens and their egg quality, hatchability, bone analysis and strength in relation to calcium and phosphorus in blood plasma.

El-Boushy, A. R.
Netherlands Journal of Agricultural Science 27 (2) 176-183 (1979) [23 ref. En] [Dep. of Poultry Husbandry, Agric. Univ., PO Box 338, 6700 AH Wageningen, Netherlands]

432 medium-heavy laying hens were used in a 6-month feeding trial conducted to evaluate effects of the available P level in the diet (0.16, 0.20, 0.40, 0.60, 0.80 or 1.00%) on performance and egg quality. Tables of results are given. Egg wt. increased but % shell, shell thickness and shell index decreased with increasing P level in the diet. Albumen index and yolk index were not significantly influenced by dietary P level. AJDW

58

Effect of pH on eggshell penetration by salmonellae.
Sauter, E. A.; Petersen, C. F.; Parkinson, J. F.; Steele, E. E.

Poultry Science 58 (1) 135-138 (1979) [10 ref. En] [Anim. Sci. Dep., Univ. of Idaho, Moscow, Idaho 83843, USA]

Experiments were conducted to study effects of pH on penetration of eggs by 3 spp. of *Salmonella*. Eggs having an average sp. gr. of 1.078 were subjected to challenge by either *S. typhimurium*, *S. St. paul* or *S. derby*. Challenge solutions ranged from pH 5.0 to 9.5 in 0.5 pH increments and contained an average of 7.5×10^3 *Salmonella*/ml. Egg temp. was 22°C and solution temp. 4.4°C when challenged. Tartaric acid (10%) or 1N NaOH were used to adjust solution prior to adding challenge organisms. Eggs were challenged for 3 min then allowed to dry and held at 22°C for 24 h, after which they were opened aseptically. Salmonella penetration was determined by swabbing the inner shell membrane and incubating in selenite cystine and tetrathionate enrichment broths for 24 h followed by

plating on MacConkey and SS agars. Penetration rates for all 3 organisms were significantly less at pH 5.0 than at any higher pH tested. There was an increase in penetration from pH 5.5 to 7.0 for all sp. Max. penetration rates were 42% of eggs challenged at pH 7.5, 22% at pH 8.5, and 34% at pH 7.0 for *S. typhimurium*, *S. derby*, and *S. St. paul*, resp. In no case was penetration of eggs at pH 9.0 significantly different from pH at max. penetration of challenge eggs. Penetration by *S. St. paul* at pH 9.5 was significantly less ($P < 0.05$) than at pH 7.0. Decalcification of the eggshell was less than 0.01%/min at pH 4.0. Shell losses at pH 3.5 and 3.0 were 0.03% and 0.33%/min, resp. AS

59

Preservation of eggs.

Pyne, A. K.

Poultry Guide 16 (3) 57-59 (1979) [En] [Directorate of Anim. Husbandry, Gov. of W. Bengal, India]

Aspects covered include: changes in eggs during spoilage; and preservation of eggs by cold storage, oiling, coating with lime, heat treatment, or storage in a CO₂ atm. CFTRI

60

[Effect of ultraviolet irradiation of hens on egg quality.]

Faitel'berg-Blank, V. R.; Dygas, A. T.; Chan Kao Dyong
Vestnik Sel'skokhozyaistvennoi Nauki, Moscow, USSR No. 5, 65-68 (1979) [16 ref. Ru, en, de, fr] [Odesskii Sel'skokhoz. Inst., Odessa, USSR]

A total of 530 hens (breed not stated) was divided into 3 matched groups which were fed and kept alike. (i) group served as control, while (ii) and (iii) groups were exposed to radiation of a UV lamp at 66 mer/h/m² and 330 mer/h/m² resp. during the mornings of April-May. A total of 275 eggs was collected from (i)-(iii). Mean values with s.e. were resp.: egg wt., 42.95 ± 1.83 , 48.71 ± 1.93 and 46.77 ± 1.63 g ((i) < (ii) and (iii) at $P < 0.05$); egg-white content of egg, 59.23 ± 1.49 , 51.82 ± 0.88 and $55.19 \pm 0.87\%$ ((i) > (ii) at $P < 0.01$, and > (iii) at $P < 0.05$); egg-yolk content of egg, 28.91 ± 0.95 , 35.89 ± 0.82 and $30.93 \pm 0.83\%$ ((i) < (ii) at $P < 0.01$, and < (iii) at $P < 0.05$); shell content of egg, 9.67 ± 0.54 , 10.83 ± 0.26 and 12.33 ± 0.52 ((i) < (ii) at $P < 0.05$, and < (iii) at $P < 0.01$); and fat content of yolk, 44.92 ± 4.27 , 58.56 ± 2.35 and $58.86 \pm 3.10\%$. Protein contents of egg white decreased and those in egg yolk increased as a result of irradiation of the layers. Shell thicknesses were 0.342 ± 0.0016 , 0.353 ± 0.0052 and 0.331 ± 0.00088 mm resp. SKK

61

Effect of corn and bean replacement by dried water hyacinth on the performance of laying hens.

Hamdy, S.; Khalifah, M. M.; Khalil, A. Z.; Kosba, M. A.
Alexandria Journal of Agricultural Research 26 (3) 515-525 (1978) [17 ref. En, ar] [Dep. of Anim. Production, Fac. of Agric., Univ. of Alexandria, Alexandria, Egypt]

36 laying pullets of Alexandria breeds were assigned to 4 groups, each receiving one of 4 rations containing dried water hyacinth (DWH) as a replacement for 0, 6, 9 or 12% horse bean or corn. All diets were adjusted to

the same protein and calorie contents. Yolk index, shell thickness, egg index and albumen height of eggs from hens fed on the experimental diets differed significantly from those of controls, but remained within acceptable limits for consumption. Egg production was not significantly affected for the hens on DWH rations, except where 9% DWH replaced corn in the diet. Yolk colour was significantly increased with increasing DWH levels. JRR

62

Rapeseed meal and egg taint: treatment of rapeseed meal to reduce tainting potential.

Fenwick, G. R.; Hobson-Frohock, A.; Land, D. G.; Curtis, R. F.

British Poultry Science 20 (3) 323-329 (1979) [23 ref. En] [Agric. Res. Council Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

Treatment of rapeseed meal with $\text{Ca}(\text{OH})_2$ suspension decreased the sinapine content by up to 90%. Smaller decreases were obtained by autolysis, steaming and treatment with NH_3 . When treated meal was fed to susceptible ('tainting') hens the concn. of trimethylamine in the eggs was decreased to much less than that required to cause taint. AS

63

Physical and chemical characteristics of Small White turkey eggs from older commercial breeder flocks with an examination of changes due to weight and time after lay.

Moran, E. T., Jr.; Reinhart, B. S.

Poultry Science 58 (2) 341-349 (1979) [44 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario N1G 2W1, Canada]

2 commercial breeder flocks of Small White type turkeys that were older than average provided 8000 eggs. One flock (48 wk. of age) had a history of poor poult yield of eggs set while the other (55 wk) was above average. Eggs saved for analysis (480) were selected on the basis of median wt. within equal number groups categorized as being high, medium high, medium low and low relative to the average for the entire population from each flock. Total egg, yolk, shell, outer, inner, and thick albumen wt. were determined along with their solids content at 5, 6, 8, 11, and 14 days after laying (15°C, 85% RH). Albumen height and shell deformation were also ascertained. There were no interactions between egg source, size, and storage with all parameters measured. Both flocks had a normal frequency distribution of egg wt. with the average from the older being heavier than that for the younger group (86.0 vs. 83.1 g). With both flocks the proportion of yolk and shell increased while albumen decreased as egg size was reduced. All 3 albumen fractions changed little in solids content and amount relative to their total as did albumen height and shell strength with changes in egg size. Small eggs lost more wt. as a percentage of their initial size with time after lay than large which could be attributed to water evaporation that came in large part from the outer thin albumen. Yolk dry matter was unaltered with egg size but decreased upon storage. A comparison of shell strength between flocks showed that eggs from 55 wk old breeders were poorer than

48 wk hens. Conversely, the older birds had a better albumen height which was accompanied by a greater proportion of thick and less inner thin albumen than observed with eggs from the younger flock. The lower interior quality with 48- as opposed to 55-wk-old birds was the only parameter measured which was in conflict with established observations based upon the chicken and suggested as a possible connection to a parallel situation involving prior reproductive capacity. AS

64

The effects of choline and sinapine bisulfate in a laying ration on the incidence of fishy odor in eggs from brown-shelled egg layers.

Goh, Y. K.; Mueller, M. M.; Clandinin, D. R.; Robblee, A. R.

Canadian Journal of Animal Science 59 (3) 545-549 (1979) [11 ref. En, fr] [Dep. of Anim. Sci., Univ of Alberta, Edmonton, Alberta T6G 2E3, Canada]

2 experiments were conducted in which the effects of including in the ration free choline, supplied as choline chloride or as hydrolysed sinapine (ester of sinapic acid and choline), and bound choline, supplied as sinapine from rapeseed meal, on the fishy odour and the trimethylamine (TMA) content of eggs laid by brown-shelled egg layers were assessed. The results indicated that at the levels fed, free choline does not cause the production of fishy eggs; however, 57% of the eggs produced by the birds fed a comparable level of bound choline in the form of sinapine had a fishy odour and contained appreciable amounts of TMA. AS

65

Chemical composition of chicken egg as influenced by crossing, hatching time and season.

El-Gammal, A. M.; Abo-Elkasem, M.; Hassan, G. M.; Khatab, M. S.

Alexandria Journal of Agricultural Research 26 (3) 537-543 (1978) [15 ref. En, ar] [Dep. of Anim. Production, Fac. of Agric., Univ. of Alexandria, Alexandria, Egypt]

A total of 2880 eggs representing 3 genotypes (Dandarawi (DN), Rhode Island Red (RI), DN \times RI and RI \times DN) and 2 successive hatches (March, April and May) was analysed chemically on a monthly random sample basis from Dec. 1975 to Nov. 1976. There were no significant differences between the 2 breeds in terms of protein or moisture content of yolk, while yolk fat content was significantly lower in DN eggs than in RI eggs. The moisture content of egg white was slightly higher in DN than RI, while the reverse was true of protein content of the white. There were no significant differences between crossbreeds and purebreeds in yolk parameters, while protein and moisture contents of egg white from crossbreeds were intermediate between those of purebreeds. The date of hatch had no significant effect on composition of eggs. Moisture in yolk increased during the hotter months, with a decrease in protein and fat levels; however, egg white moisture levels decreased during hot months, and protein content increased. Other seasonal fluctuations were less marked. Analysis showed a significant linear increasing trend with age for fat content of yolk and protein content of both yolk and white. No trend was

detectable for moisture contents. Fat and protein levels of yolk were both significantly and negatively correlated with moisture content; also, protein and moisture contents of the white were negatively correlated. AS

66

[Studies on a new method for preservation of fresh hens' eggs at ambient temperature.]

Bernaola, O. A.; Perez Murillo, O. A.; Montilla, J. de J. *Archivos Latinoamericanos de Nutricion* 29 (2) 261-276 (1979) [20 ref. Es, en] [Univ. Catolica 'Andres Bello', Caracas, Venezuela]

A new method of preserving eggs is described, comprising dipping in liquid polyvinyl chloride/acetate resin to form a thin plastics coating on the shell. Studies were conducted on changes in the quality of treated and control eggs during storage at room temp. (average 22°C) for ≤ 135 days. Quality characteristics studied were: wt. loss, pH of the yolk and the thick and thin albumen, Haugh unit scores, yolk diam., and yolk height/diam. ratio; graphs of results are given. The results show the plastics coating to increase quality retention considerably; coated eggs remained acceptable after storage for 135 days. The yolk membrane of control eggs ruptured after storage for 55-65 days. AJDW

67

Production and quality characteristics of quail eggs.

Tiwari, K. S.; Panda, B.

Indian Journal of Poultry Science 13 (1) 27-32 (1978) [17 ref. En] [Poultry Res. Div., Indian Vet. Res. Inst., Izatnagar, Uttar Pradesh, India]

The average wt. of a fully grown, female, Japanese quail was 137 g; that of an egg was 10.2 ± 0.58 g (i.e. 8% of the body wt. of the quail). The egg contained 59.5% albumen, 31.0% yolk, and 9.5% shell + shell membrane; its chemical composition was: moisture 73.8%, protein 13.2%, fat 10.8%, carbohydrates 1.1%, and ash 1.1%. The calorific value was 201 kcal/100 g edible portion. The shape index, albumen index, yolk index, and Haugh unit values of quail eggs were found to be 79.1, 0.10, 0.489, and 87.1, resp. During storage, the albumen quality deteriorated rapidly, while the yolk quality deteriorated only gradually; the deterioration was greater at room temp. than under refrigeration. CFTRI

68

Variation in gross components, yolk lipid and yolk cholesterol content of eggs during pullet year production in Australorp.

Chand, D.; Georgie, G. C.; Razdan, M. N.

Indian Journal of Poultry Science 13 (2) 73-77 (1978) [13 ref. En] [Dep. of Anim. Production Physiol., Haryana Agric. Univ., Hissar-125 004, India]

Egg albumen, yolk and shell wt., and yolk lipid and yolk cholesterol contents were recorded monthly during the pullet yr (i.e. 6-18 months of age) production from hens of the Australorp breed. A highly significant increase was recorded for all the traits over the 1-yr period, but the increase during the 1st 5 months was not

significant. The average wt. of egg, albumen, yolk, and shell were 48.56, 30.13, 14.08, and 4.42 g, resp.; the yolk lipid value was 319.38 mg/g yolk (or 4.5 g/yolk) and the yolk cholesterol value was 22.72 mg/g yolk (or 312.27 mg/yolk). The max. cholesterol value was recorded in Nov. (age 13 months) when the birds were moulting. CFTRI

69

Effect of light, vitamin D and dietary phosphorus on egg-shell quality late in the pullet laying year.

Yannakopoulos, A. L.; Morris, T. R.

British Poultry Science 20 (3) 337-342 (1979) [14 ref. En] [Dep. of Agric. & Hort., Univ. of Reading, Earley Gate, Reading RG6 2AT, UK]

18 diets supplying all combinations of three P contents (3.1, 4.0 and 4.8 g non-phytate P/kg) and six vitamin D supplements (37.5 or 150 μ g cholecalciferol/kg; or 16 or 24 μ g 25-hydroxycholecalciferol/kg; or 37.5 μ g cholecalciferol/kg with either 16 or 24 μ g 25-hydroxycholecalciferol/kg) were fed to 2880 pullets of 2 stocks from 64 to 74 wk of age. The birds were housed in 8 light-proof rooms, 4 of which had 24-h light-dark cycles (16L:8D) and 4 had 28-h cycles (20L:8D). The dietary treatments had no significant effect upon food intake, egg output, shell thickness, shell deformation or sp. gr. of the eggs. The 28-h cycle reduced mean rate of lay by 4.5%, increased egg wt. by 5.8% and increased shell thickness by 9.4%. The proportion of eggs with shell faults revealed on candling was reduced from 4.1% to 2.8%. It is concluded from this and other sources that decreasing dietary P or modifying vitamin D supplements may sometimes lead to increases in shell thickness of the order of 1 to 2%, but that these changes are unlikely to result in a measurable reduction in the proportion of cracked eggs late in the laying yr. A 28-h light-dark cycle results in a longer and more uniform interval between consecutive ovipositions and thus gives reliable increases in shell thickness which are large enough to reduce the proportion of cracked eggs in many practical situations. Whether it is profitable to use an ahemeral cycle will depend upon the relative prices paid for eggs of different sizes. AS

70

Role of nutrition on chemical composition of chicken egg.

Narahari, D.

Poultry Guide 16 (10) 33-37 (1979) [12 ref. En] [Dep. of Poult. Sci., Madras Vet. Coll., Madras, Tamilnadu, India]

71

Factors influencing egg quality.

Shrivastava, H. P.

Poultry Guide 16 (10) 71-75 (1979) [En] [Div. of Poult. Res., Indian Vet. Res. Inst., Izatnagar, Uttarpradesh, India]

Factors affecting egg quality parameters (egg size, shell quality, albumen quality, yolk quality, flavour, blood spots, chemical composition and nutritional value) are reviewed. CFTRI

72

[Method for disinfection of eggs.]

Pimenov, B. I.; Emel'yanov, N. I.; Voronin, M. I.
USSR Patent 651 774 (1979) [Ru]

To reduce process time and improve efficiency, eggs are heat treated using an amplitude-modulated high-frequency electromagnetic field. The carrier frequency is $1.0\text{--}1.2 \times 10^9$ Hz with a field voltage of 200–250 V/cm, and the modulating frequency is $1.0\text{--}1.5 \times 10^7$ Hz with a field voltage of 150–200 V/cm. Treatment is preferably carried out for 1–4 h periodically with a pulse ratio of $10\text{--}10^2$ and an interval of 0.1–1 s. Processing requires 1–4 h. W&Co

73

[Preserved fried egg.]

Nakano Sumise Co. Ltd.

Japanese Examined Patent 5 424 462 (1979) [Ja]

A fried egg product is preserved by incorporation of a vinegar solution containing egg shell and sodium bicarbonate or NaOH. IFT

74

Simultaneous determination of phosphorus-32 and calcium-45 activity in biological samples.

Bem, H.; Reimschüssel, W.

Journal of Radioanalytical Chemistry 52 (2) 361–367 (1979) [9 ref. En] [Inst. of Applied Radiation Chem., Tech. Univ. Lodz, Wroblewskiego 15, Poland]

Using the technique of liquid scintillation, ^{32}P and ^{45}Ca activities were determined in biological samples such as bones, blood, muscles, milk, and egg shells, white and yolk. Samples were mineralized in 70% HClO_4 and 30% H_2O_2 at 70°C and measured after addition of the 'Aqual' scintillation liquid. A correction for quenching was made by the method of sample channels ratio. High detection efficiencies were obtained, $>80\%$ for ^{45}Ca and about 50% for ^{32}P in a second measuring channel. Recoveries from the samples mentioned above amounted to 95–104% for ^{32}P and to 94–98% for ^{45}Ca . AL

75

[Survey of pollution with polychlorinated biphenyls (PCB) in Tokyo. V. PCB content of foods.]

Yamazaki, K.; Yamanobe, H.; Suzuki, S.; Koizumi, S.; Harada, H.

Annual Report of Tokyo Metropolitan Research Laboratory of Public Health 28 (1) 107–110 (1977) [8 ref. Ja, en] [Tokyo Metropolitan Res. Lab. of Public Health, 24-1, Hyakunincho 3 chome, Shinjuku-ku, Tokyo, 160 Japan]

PCB concn., determined by gas chromatography, are tabulated [in En] for various foods. 150 samples of fish and shellfish meat (47 spp. in total) had a mean content of 0.04 p.p.m. (range 0.00–0.74 p.p.m.). 19 meat samples had low contents of PCB (range 0.00–0.03 p.p.m.), as did 10 egg samples (0.00–0.01 p.p.m.) and 25 dairy products (butter, cheese, dried milk, milk, 0.00–0.06 p.p.m. in extractable fat). [From En summ. and tables.] [See FSTA (1978) 10 9C315 for part IV.] DIH

76

Chemical inhibition of Gram negative organisms.

Pickens, H. L.; Banwart, G. J.

Abstracts of the Annual Meeting of the American Society for Microbiology 79, 215 (1979) [En] [Ohio State Univ., 190 North Oval Drive, Columbus, Ohio 43210, USA]

The effect of EDTA on the viability of certain Gram-negative bacteria was determined. Reduction of *Salmonella typhimurium* in 0.01M phosphate buffer at pH 7.2 and 8.5 supplemented with various concn. of EDTA with and without lysozyme was determined by the standard plate count method. The plate count revealed little difference in cell destruction whether or not lysozyme was present. Various salmonellae, *Escherichia coli*, and *Pseudomonas fragi* were added to sterile egg white supplemented with various concn. of EDTA. Addition of 5.0 mg EDTA/ml resulted in a reduction of $10^6\text{--}10^7$ organisms/ml in <24 h at 25°C . Agitation during incubation did not increase the death rates obtained. Supplementation of liquid whole egg with up to 25.0 mg EDTA/ml had little effect on the viability of *S. typhimurium*. An attempt to recover sublethally stressed cells was performed using a medium containing additional divalent cations necessary for cell growth. Additional colonies were not recovered on this medium. AS

77

Process for improving the functional properties of protein material.

Chao, K. C.; Ridgway, J. A., Jr.; Schnell, P. J.; Pearce, J. H. (Standard Oil Co.)

United States Patent 4 178 391 (1979) [En]

A process is described for improving the functional properties of protein-containing materials, in which an aqueous slurry having a pH of 6.6 to 8.0 is heated at $75\text{--}100^\circ\text{C}$ and then dried, and can be used to replace egg solids and non fat dry milk. IFT

78

Effects of low and high glucosinolate rapeseed meals on productive performance, egg quality, composition of liver and incidence of haemorrhagic liver syndrome in laying birds.

Thomas, D.; Robblee, A. R.; Clandinin, D. R.

British Poultry Science 19 (4) 449–454 (1978) [13 ref. En] [Dep. of Anim. Sci., Univ. of Alberta, Edmonton, Alberta T6G 2E3, Canada]

Diets containing 100, 125 and 150 g/kg of (i) low glucosinolate rapeseed meal (prepared from the Tower cv. of rape) and diets containing 100 and 150 g/kg of (ii) high glucosinolate rapeseed meal (prepared from a mixture of Midas and other high glucosinolate cv.) were fed to layers for 44 wk. Egg wt., sp. gr. and Haugh unit values were unaffected when (i) was included at rates up to 150 g/kg whereas inclusion of (ii) at the 2 levels decreased egg production and Haugh unit values when compared with the results obtained from a control diet based on soybean meal. None of the treatments affected liver wt., spleen wt., composition of liver, liver fat score or incidence of haemorrhagic liver syndrome. VJG

79

[Effects of storage on the quality of eggs.] Der Einfluss der Lagerung auf die Qualität von Konsumeiern.

Scholtyssek, S.; Raber, A.; Deissler, E.

Archiv für Geflügelkunde 43 (1) 11-17 (1979) [5 ref. De, en, fr, ru] [Lehrstuhl für Kleintierzucht, Univ. Hohenheim, 7000 Stuttgart 70, Federal Republic of Germany]

A study on factors influencing the storage quality of eggs is described. Factors studied were: hen strain (2 strains laying brown eggs and 2 laying white eggs being studied); hen age (7, 9.5 or 12 months of laying); egg wt. (large vs. small); storage time (7, 14 or 28 days); and storage temp./RH (25°C/45% RH vs. 12°C/67% RH). Tables of results are given for air sac size, egg wt., egg yolk index and albumen height of 3120 stored eggs. Variance and regression analyses of results are presented, together with correlation coeff. between the variables studied. The results are discussed in detail. It is concluded that air cell size is of little value as an index of egg quality, as it can be manipulated by alteration of storage conditions. On the basis of the results, it is concluded that yolk index and albumen height are the best measures of egg quality. Storage conditions (time and temp./RH) were the main factors influencing egg quality. AJDW

80

[Studies on pasteurization and quality maintenance of egg for industrial use. VII. Evaluation by confectionery test of quality of frozen whole egg pasteurized under various conditions of heat treatment.]

Ehara, H.; Yamanaka, Y.; Nonami, Y.

Japanese Journal of Dairy and Food Science [Rakuno Kagaku Shokuhin no Kenkyu] 28 (5) A189-A193 (1979) [6 ref. Ja, en] [Dep. of Anim. Sci., Tokyo Univ., Tokyo, Japan]

8 batches of frozen whole egg, pasteurized under various heat treatment conditions (30 min at 50-60°C, with or without prior frozen storage for 1 month) and subjected to ≤ 3 freeze/thaw cycles, were evaluated. The results show that whipping ability decreased with increasing pasteurization temp. Thawing and refreezing impaired whipping capacity, especially for samples pasteurized at $> 55^\circ\text{C}$. Whipping ability of egg pasteurized after prior frozen storage for a month was inferior to that of samples not subjected to prior frozen storage. It is stated that pasteurization of previously frozen egg at $> 57^\circ\text{C}$ for 30 min is not generally desirable for samples intended for confectionery use. However, the texture of custard pudding made using whole egg pasteurized at 57° or 58°C for 30 min was superior to that of batches made with fresh eggs or commercial frozen whole egg. [From En summ.] [See FSTA (1980) 12 2Q33 for part VI, and following abstr. for part VIII.] AJDW

81

[Studies on pasteurization and quality maintenance of egg for industrial use. VIII. Applicability of a simplified coliform test to detecting the pasteurization of liquid eggs.]

Yamanaka, Y.; Nonami, Y.; Furukawa, N.

Japanese Journal of Dairy and Food Science [Rakuno Kagaku Shokuhin no Kenkyu] 28 (5) A195-A200

(1979) [7 ref. Ja, en] [Dep. of Anim. Sci., Tokyo Univ., Tokyo, Japan]

Samples of liquid whole egg pasteurized under various heat treatment conditions were used in studies on the suitability of the Bactester No. 1 simplified coliform test for detn. of efficiency of pasteurization. Comparative data are given for coliform counts of raw, contaminated and heat-treated liquid egg, and egg cold stored for ≤ 6 months, determined by the Bactester method, by plate counting on eosin-methylene blue (EMB) or desoxycholate agar, or using brilliant green/lactose/bile (BGLB) broth. The results show that the Bactester method agreed well with results of plate counting on EMB or desoxycholate agar at low coliform counts, but not at high counts; the relation between Bactester results and results in BGLB broth was variable. The results suggest that the Bactester is not suitable for reliable detection of pasteurization of liquid egg; it might, however, be of use as a rough guide as to whether liquid egg has been pasteurized at $57-58^\circ\text{C}$ for 30 min. [From En summ.] [See preceding abstr. for part VII.] AJDW

82

Effects of pH and neutral salts on the formation and quality of thermal aggregates of ovalbumin. A study on thermal aggregation and denaturation.

Hegg, P.-O.; Martens, H.; Löfqvist, B.

Journal of the Science of Food and Agriculture 30 (10) 981-993 (1979) [23 ref. En] [Biochem. 1, Chemical Cent., POB 740 S-220 07, Lund 7, Sweden]

Temp. of aggregation and denaturation, and DM content of thermal aggregates, were studied for solutions of ovalbumin and S-ovalbumin (from old eggs) in salt-free or NaCl or CaCl_2 solutions at pH 3-11. S-ovalbumin had higher denaturation temp. than ovalbumin; ovalbumin denaturation temp. were unaffected by 170mM NaCl, but were decreased by 17mM CaCl_2 , particularly at pH > 5 . S-ovalbumin also had higher temp. of aggregation than ovalbumin; aggregation occurred only in a narrow pH band in salt free solution (pH 4.0-5.5) but occurred over the entire pH range in salt solutions, CaCl_2 having a particularly pronounced effect at pH > 6 . Quality of thermal aggregates was also studied in terms of DM content (transparent gels $< 5\%$ DM to gel-like precipitates 9-13% DM). Results, presented graphically, show regions of iso-DM content for variations in pH and salt concn. Regardless of salt type or concn., aggregates had high DM content at or near the isoelectric point. Increasing salt concn. increased the pH range producing high-DM aggregates, but in general gels predominated at alkaline pH in NaCl ($\leq 170\text{mM}$), and precipitates predominated at alkaline pH in CaCl_2 ($\geq 8.5\text{mM}$), both salts behaving similarly at pH 3-4. Low concn. of SDS acted synergistically with increase in pH to lower DM content of aggregates. In general, thermal aggregates were precipitates when aggregation temp. was below denaturation temp., and were gels when aggregation temp. was equal to or above denaturation temp. DIH

83

***Leucaena leucocephala* in poultry diets for the tropics.**

D'Mello, J. P. F.; Taplin, D. E.

World Review of Animal Production 14 (3) 41-47 (1978) [36 ref. En] [Dep. of Agric. Biochem., Edinburgh School of Agric., Edinburgh, UK]

This review on the potential for use of leaf meal from the tropical leguminous shrub *Leucaena leucocephala* as a component of poultry diets includes a discussion of literature data on effects of *L. leucocephala* leaf meal on laying performance, egg wt. and egg quality (yolk colour, shell wt., shell thickness). In general, it appears that feeding moderate levels of *L. leucaena* leaf meal enhances yolk colour but has only small effects on the other egg characteristics. AJDW

84

Response of three strains of egg-type pullets to three feed restriction regimes imposed during rearing.

Abu-Serewa, S.

Australian Journal of Experimental Agriculture and Animal Husbandry 19 (100) 547-553 (1979) [11 ref. En] [Dep. of Agric., Werribee, Victoria, Australia]

Groups of light, medium and heavyweight White Leghorn \times Australorp pullets were used in studies on effects of feed restriction on laying performance and egg quality. 3 feed restriction methods were used: (i) fed 80% of the ad lib. intake from 6 to 21 wk of age; (ii) restricted in feeding time to 6 h in every 48 h, from 6 to 21 wk of age, and (iii) feeding a diet with only 10% protein from 1 day of age to 16 wk of age. Tables of data are given, including values for % of eggs in each of 3 wt. grades, % second-quality eggs, sp. gr., and albumen heights. Heavy strain pullets laid fewer but heavier eggs than light strain pullets and had a higher % of second-quality eggs. Sp. gr. was highest for eggs laid by the light strain and lowest for eggs laid by the heavy strain. Albumen height was greatest for the heavy and least for the light strain. Treatment (iii) gave smaller eggs, but a lower % second-quality eggs than the other treatments; feed restriction did not significantly influence sp. gr. or albumen height. AJDW

85

[Dietary protein and egg quality. I. Effects of various proteins on the internal quality and functional properties of eggs.]

Sauveur, B.; Zybko, A.; Colas, B.

Annales de Zootechnie 28 (3) 271-295 (1979) [55 ref. Fr, en] [Sta. de Recherches Avicoles, Cent. de Tours, INRA, Nouzilly, 37380 Monnaie, France]

144 Warren ISA laying hens were used in a comparative study on effects of dietary protein sources on egg quality. Control diets contained soybean meal. The test diets contained: (i) 30% field peas; (ii) 15% field beans; (iii) 10% Norwegian fish meal; (iv) 6% lucerne protein concentrate; (v) 10% meat + bone meal; or (vi) 11.5% *Spirulina* algae. Diets containing (i)-(vi) were adjusted to equal protein concn. (150 g/kg) by addition of soybean meal. Each diet was fed for 6 wk. Egg quality criteria studied were: wt., % broken eggs, breaking strength of the shell, Haugh unit score, yolk colour, incidence of meat spots and blood spots.

foaming capacity of the albumen and emulsifying capacity of the yolk. Tables of results are given, (i) and (ii) had little effect on the quality characteristics studied. (iii) reduced frequency of blood spots while (iv) improved yolk coloration, decreased incidence of blood spots, and enhanced albumen foam stability and the emulsifying capacity of the yolk. (v) reduced incidence of cracked eggs, increased yolk colour intensity, and improved albumen foam stability and the emulsifying capacity of the yolk. (vi) slightly improved Haugh score, and enhanced yolk coloration. Storage of eggs at 18°C for 3 wk impaired albumen foam stability, and suppressed dietary effects on albumen characteristics. Albumen foam stability of eggs laid by hens fed the control diet decreased with increasing hen age. AJDW

86

Distribution of mercury and selenium in egg components and egg-white proteins.

Magat, W.; Sell, J. L.

Proceedings of the Society for Experimental Biology and Medicine 161 (4) 458-463 (1979) [14 ref. En] [Dep. of Anim. Sci., Iowa State Univ., Ames, Iowa 50011, USA]

Methylmercuric chloride (Hg) at 20 p.p.m. and sodium selenite (Se) at 8 p.p.m. were fed, separately and in combination, to laying hens. Oral doses of $\text{CH}_3^{203}\text{HgCl}$ and $\text{H}_2^{75}\text{SeO}_3$ also were given to all hens. The concn. of ^{203}Hg and ^{75}Se in egg white and egg yolk, and the distribution of the radioisotopes among proteins of egg white, were determined. The highest concn. of ^{203}Hg were observed in egg white. The 8 p.p.m. of dietary Se significantly increased the concn. of ^{203}Hg in egg white when compared with a diet containing no added Se. At the same time, the addition of Se to the diet reduced ^{203}Hg in the egg yolk. ^{75}Se was found primarily in egg yolk, but 20 p.p.m. dietary Hg significantly decreased ^{75}Se in the egg yolk and increased it in the egg whites. A significant Hg \times Se interaction was observed for deposition of ^{75}Se in egg white. When dietary Hg was fed separately from dietary Se, ^{75}Se deposition was increased in the egg whites. More than 97% of the total ^{203}Hg in egg white was associated with ovalbumin. Similarly, total Hg was found in greatest quantities in ovalbumin, irrespective of the addition of dietary Hg or Se. The largest proportion of total ^{75}Se dose and the highest concn. of total Se/unit of protein occurred in globulin, especially when 8 p.p.m. Se were fed. The data illustrate preferential binding of Hg by ovalbumin and of Se by globulin as compared with other major proteins of egg white. AS

87

Effect of dietary rapeseed products on the selenium content of meat and eggs.

Arthur, D.; Slinger, S. J.

Canadian Institute of Food Science and Technology Journal 12 (4) 170-172 (1979) [12 ref. En, fr] [Dep. of Nutr., Univ. of Guelph, Guelph, Ontario N1G 2W1, Canada]

A series of 4 experiments was conducted in which practical use levels of Tower and Candle rapeseed meals were included in diets for broiler chickens, laying hens and growing-finishing pigs to determine the

efficacy of these products in providing Se to the animals. Organic Se from rapeseed was better utilized than the inorganic Se from sodium selenite. At use levels of 15–20% rapeseed meal in corn, soybean type diets for broiler chickens, laying hens or growing-finishing pigs no inorganic Se need be added to prevent Se deficiency, and the meat and eggs produced would appear to be at desirable levels of Se for human consumption. AS

88

[Optimization of transport of eggs within Romania. Use of containers.]

Barbu, N.

Revista de Cresterea Animalelor 29 (4) 45–47 (1979)
[Ro][Intreprinderea Avicola de Stat Crevedia, Buciumeni, Romania]

Problems with manual handling, etc. of fresh eggs in small containers are briefly discussed. A mechanized system for handling and distribution of eggs in large containers (capacity 4320 eggs) is discussed, with reference to economies, reduced labour requirements, and reduced incidence of breakage; studies showed the containerized system to give 1.8% less breakage than the system previously used (5.9% vs. 7.7%). AJDW

89

[Use of neutron activation analysis for the analysis of poultry products.]

Szabo, A.; Huber, M.

Baromfitenyestés és Feldolgozás 26 (2) 88–91 (1979)
[15 ref. Hu][Megyei Élelmiszerellenőrző & Vegyvizsgáló Intézet, Veszprem, Hungary]

Neutron activation analysis can be used not only for the detn. of essential (e.g. Cu, Zn, Mn, Se) and toxic (e.g. Hg, Pb, As) trace elements, but also for detn. of biological macroelements, Na, K, Ca, Mg, P, Cl and N. When the As contents of various poultry products were determined by neutron activation analysis (measurements made with a 50 cm³ Ge(Li) detector attached to a 4096 channel analyser, using the 559 keV gamma line of ⁷⁶As) the following results were obtained (mg/kg): chicken meat 0.11 ± 0.05, chicken liver 0.29 ± 0.07, chicken egg 0.15 ± 0.0, turkey liver 0.06 ± 0.01, turkey heart 0.03 ± 0.03 and turkey kidney 0.16 ± 0.07. For N detn., the ¹⁴N(n,2n)¹³N or the ¹⁴N(n,γ)¹³N reactions are generally used. ESK

90

[Technology of poultry meat and egg products.]

Tekhnologiya myasa ptitsy i yaitseproduktov. [Book] Guslyannikov, V. V.; Podlegaev, M. A. 288pp. (1979)[42 ref. Ru] Moscow, USSR; Pishchevaya Promyshlennost'. Price 0.95r

Chemical composition, properties and nutritive value of poultry meat and eggs are dealt with, and the theory of poultry and eggs processing is discussed. Chapters are: Characteristics of poultry meat (pp. 5–22); Poultry skin and its processing (pp. 23–33); Purchase and transportation of poultry prior to slaughter (pp. 34–46); Poultry slaughtering and processing (pp. 47–55); Poultry slaughtering and processing using mechanized and

automated equipment (pp. 56–120); Preparation of poultry meat for retailing (pp. 121–134); Poultry meat processing (pp. 135–149); Quality evaluation of poultry meat (pp. 150–154); Processing of feathers (pp. 155–166); Egg processing: chemical composition (pp. 167–168); Processing of fresh eggs (pp. 169–195); Storage of eggs (pp. 196–206); Egg products preservation (pp. 207–265); Egg shell processing for feeding purposes (pp. 266–267); and Quality control (pp. 268–284). STI

91

The effect of forced molting (resting) on the performance of chickens laying brown eggs.

Gerry, R. W.

Bulletin, Life Sciences and Agriculture Experiment Station, University of Maine No. 755, 19pp. (1979)
[29 ref. En][Univ. of Maine, Orono, Maine, USA]

Trials were conducted to study the effects of forced moulting (resting) on the performance of 2 types of medium wt., brown egg-laying hens. The treatments involved forced moults after (i) 6, 12 and 18 months of laying, (ii) 12 months of laying, and (iii) 9 and 18 months in experiment I, or 8 and 16, and 10 and 20 months in experiment II. Eggs laid before and after each moulting period were sampled. Egg albumen quality increased in most samples following a forced moult, with an average increase of 4.7 Haugh units (range –2 to +13) in experiment I and 4.0 (–1.8 to +11.4) in experiment II. Forced moults had little effect on egg wt., and shell thickness was slightly greater only in experiment II. There seemed to be little advantage in forced-moulting. AL

92

[Studies on the keeping quality of hens' eggs.

I. Effects of coating egg shell with edible vegetable oils.]

Okuyama, M.; Shigenaga, K.; Yamauchi, K.; Murata, H.; Hidaka, T.; Ohtsuka, H.

Japanese Poultry Science [Nihon Kakin Gakkai-shi] 16 (4) 210–214 (1979)[9 ref. Ja, en][Miyazaki Agric. Exp. Sta., Sadowara-cho, Miyazaki-shi 880-02, Japan]

3 vegetable oils, viz. (i) a palm and safflower oil mixture (subjected to fractional distillation); (ii) a coconut oil; and (iii) a mixture of (i) and (ii), were used to coat chicken eggs within 8 h of laying. Coated and uncoated eggs were held in a room at 22–34°C, 45–89% RH, and analysed at intervals during 5 wk for Haugh unit score, thick albumen height, albumen pH, egg wt. loss, incidences of collapsed yolk and rottenness, and incidence of undried oil coatings. Coating with vegetable oil maintained a high interior quality and reduced the incidence of collapsed yolk and wt. loss. Coated eggs maintained 58–59 Haugh units during 3 wk, while uncoated eggs dropped to 45 units in 1 wk and thereafter to 6 units within 3 wk storage. [From En summ.][See following abstr. for part II.] JRR

93

[Studies on the keeping quality of hens' eggs. II. Lipid peroxidation and migration into the edible part (albumen and yolk) of vegetable oil on the coated eggs.]

Yamauchi, K.; Murata, H.; Okuyama, M.; Shigenaga, K.; Hidaka, T.; Ohtsuka, H.

Japanese Poultry Science [Nihon Kakin Gakkai-shi] 16 (4) 160-165 (1979) [11 ref. Ja, en] [Fac. of Agric., Miyazaki Univ., Miyazaki-shi 880, Japan]

Peroxide values (PV) were measured colorimetrically for lipids from shell + shell membrane, and from the edible parts of eggs coated with 5 kinds of edible oil, viz. (i) a mixture of palm and safflower oils subjected to fractional distillation; (ii) as for (i), supplemented with 150 p.p.m. α -tocopherol; (iii) as for (i), supplemented with 300 p.p.m. α -tocopherol; (iv) a coconut oil and (v) a mixture of (i) and (iv). 30-40 mg oil were applied to each egg; these and uncoated controls were held at 25-31°C, 60-93% RH for 5 wk during the summer, with weekly PV detn. During storage, PV ranged from 1.3 to 6.7 m-equiv./kg in the shell fraction, while PV in the edible part was always <0.4 m-equiv./kg, compared to 0.1 m-equiv./kg in uncoated eggs. Migration of a radiolabelled oil mixture similar to (i) into the edible part of coated eggs during 60 days storage at 14-28°C was measured; migration of carboxyl- 14 C-tripalmitin ranged from 0.07 to 0.39% of the amount used for coating. Most of the radioactivity remained in the shell and membrane. This migration rate corresponds to approx. 0.1-0.05 times the value previously reported for mineral oil (liquid paraffin). [From En summ.] [See preceding abstr. for part I.] JRR

94

[Bacterial contamination of liquid (frozen) whole egg.]

Sashihara, N.; Mizutani, H.; Takayama, S.; Konuma, H.; Suzuki, A.; Imai, C.

Journal of the Food Hygienic Society of Japan [Shokuhin Eiseigaku Zasshi] 20 (2) 127-136 (1979) [23 ref. Ja, en] [Nat. Inst. Hygienic Sci., Kamiyoga 1-chome, Setagaya-ku, Tokyo, Japan]

During the period June 1977 to May 1978, 1035 samples of liquid whole egg and 840 samples of shell eggs were examined bacteriologically. Counts of enterococci present (10^2 /g in the unpasteurized whole eggs), were hardly decreased by pasteurization and freezing. Gram positive cocci and coryneforms were predominant on the surface of shell egg; Gram negative bacteria, such as Enterobacteriaceae, *Aeromonas* and *Pseudomonas* spp., predominated in the unpasteurized whole egg, and Gram positive bacteria such as *Staphylococcus*, *Micrococcus*, *Streptococcus* and *Bacillus* spp. were observed, together with Gram negative bacteria, in the pasteurized whole egg. TM

95

[Effect of age of laying hens on commercial quality of eggs.]

Vanchev, T.; Kaitazov, G.; Stoimenov, B.; Milanov, S.; Gatev, V.; Izraelov, F.

Zhivotnov'dni Nauki 15 (5) 62-67 (1978) [21 ref. Bg, ru, en] [Vissh Inst. po Zootekh & Vet. Med., Stara Zagora, Bulgaria]

Hybrid 56 White Leghorn layers were kept in batteries under similar conditions on the Bokhot (Pleven region) poultry factory (i) for 13 months (Dec.-Dec.) or (ii) for 16 months (Dec.-March). Totals of

2 558 965 and 3 138 600 eggs resp. were inspected and graded. Monthly and overall data are tabulated for % of sound, dirty, crushed and cracked eggs and for % size distributions. The main conclusions were that egg wt. decreased during the hot months of the yr in comparison with the other seasons; that proportion of eggs weighing > 57.5 g increased during the additional period of keeping (ii) hens; that there were no significant differences between (i) and (ii) in proportions of dirty, crushed and cracked eggs; and that group (ii) showed a 3% better return for the eggs than group (i). SKK

96

[Studies on the changes of egg contents of chickens during the laying period. I. Changes of egg weight and the weight of egg contents in connection with the age at first egg.]

Nishiwaki, M.; Ichinoe, K.; Nakajo, S.

Journal of Agricultural Science [Tokyo Nogyo Daigaku Nogatu Shuhou] 22 (1) 95-103 (1977) [15 ref. Ja, en] [Livestock Sect., Exp. Farm, Tokyo Univ. of Agric., Tokyo, Japan]

White Leghorn pullets were classified into 3 groups on the basis of age at first laying; egg wt. parameters were measured from 19 to 72 wk of age. Egg wt. increased with age in all groups; eggs from group which started laying earliest (at 130-142 days of age) were smaller than corresponding eggs from the other groups. Yolk wt. and yolk:whole egg ratio increased markedly from the first lay to 34 wk of age, and slightly thereafter, without differences among the 3 groups. Albumen wt. increased similarly, but albumen wt.:total egg wt. ratio tended to decrease with age. Shell wt. increased rapidly up to a hen age of 32 wk, and then remained constant. Shell wt.:whole egg wt. ratio decreased gradually with hen age. Wt. of whole egg and wt. of yolk, albumen and shell, were highly correlated, with especially high significance for the yolk/albumen relationship. [From En summ.] JRR

97

The effect of spectacles, a whole grain diet and dietary level of citranaxanthin on egg yolk colour, nesting behaviour and laying performance of crossbred hens.

Karunajeewa, H.; Bagot, I.

Australian Journal of Experimental Agriculture and Animal Husbandry 18 (91) 223-230 (1978) [11 ref. En] [Dep. of Agric., Werribee, Victoria, Australia]

800 White Leghorn \times Australorp pullets were used in a 2 X 2 X 2 factorial study on effects of form of the diet (complete mash vs. whole wheat + concentrate), dietary citranaxanthin level (1.5 vs. 2.5 p.p.m. in the mash diet, 6 or 100 p.p.m. in the concentrate) and fitting the hens with red plastic spectacles on laying performance and egg quality. Tables of results are given, including values for the wt. grade distribution, Haugh score, sp. gr. and yolk colour (expressed as Roche Colour Fan score or β -carotene equivalent) of the eggs. Hens fitted with the spectacles laid smaller eggs with lower Haugh scores than those not fitted with spectacles. The wheat + concentrate diet gave lower yolk colour scores than the mash diet. Yolk colour intensity increased with increasing added citranaxanthin level in the diet. AJDW

98

Egg drying apparatus.

McCord, R. C. (Diamond International Corp.)

United States Patent 4 173 831 (1979) [En]

An egg drying apparatus incorporates an improved laminar air flow for more effective drying. The orifices for discharging and directing air towards the eggs have a coeff. of discharge of ≥ 0.8 , preferably about 0.9. A fan draws air into the drying chamber and directs it towards the eggs via the orifices, which are U shaped channels with the exterior of adjacent channels forming the orifices. HBr

99

[Changes in eggs during storage.] [Review]

Szabo, A.; Huber, M.

Baromfitenyesztes es Feldolgozas 26 (4) 168-176 (1979) [33 ref. Hu] [Megyei Elélmiszerellenőrző & Vegyvizsgáló Intézet, Győr, Hungary]

Aspects considered in this review on changes in eggs during storage include: wt. loss; albumen and yolk pH; NH_3 concn.; phosphate concn.; f.p. of the yolk and albumen; free amino acid concn.; rheological properties; histamine content; lecithin content; free fatty acid content; thiamin content; bactericidal activity; and organoleptic properties. The significance of temp. and RH for changes in stored eggs is discussed. AJDW

100

[Goose egg production in three cycles.]

Kukota, M.

Baromfitenyesztes es Feldolgozas 26 (6) 245-249 (1979) [4 ref. Hu] [Baromfifeldolgozó Vallalat, Bekescsala, Hungary]

When a 3-cycle egg production system was introduced, using a flock of 1499 geese, during the first (traditional) laying period (25 Jan.-5 June, 1976) the total egg yield was 75 921 with an individual egg yield of 50.65. The average egg wt. was 155.73 g. The corresponding values for the second (20 Sept.-28 Dec., 1976) and third (15 Feb.-30 June, 1977) cycles were, resp. 754 and 688 geese, 24 155 and 19 677 eggs, 32.04 and 28.60 individual egg yields, with average egg wt. of 174.17 and 171.09 g. The results showed that in the 3-cycle egg production system, the egg yield was 21.76 (24.3%) higher than in the traditional 1-cycle egg laying period. ESK

101

Thiabendazole; tolerances for residues.

United States of America, Environmental Protection Agency

Federal Register 45 (14, Jan. 21) 3907 (1980) [En] [Washington, DC, USA]

Tolerances (p.p.m.) are established under the Federal Food, Drug, and Cosmetic Act for residues of the fungicide thiabendazole as follows: sugar beets, 6; and eggs, meat, fat and meat by-products of poultry, 0.1. CAS

102

Proceedings 1977. Cornell Nutrition Conference for Feed Manufacturers. November 1, 2 and 3, 1977, Sheraton Motor Inn, Syracuse, New York. [Conference proceedings]

United States of America, Cornell University, New York State College of Agriculture & Life Sciences; United States of America, American Feed Manufacturers Association

145 pp. (1977) [many ref. En] Ithaca, New York, USA

Papers presented at this conference include the following: Maximizing returns from corn silage rations for growing and finishing cattle (giving carcass quality traits), by D. G. Fox (pp. 33-41, 40 ref.). Nutrition and egg shell quality, by R. M. Leach, Jr. (pp. 59-62, 12 ref.). The selenium needs of laying and breeding hens (giving egg quality characteristics) by G. F. Combs, Jr. & M. L. Scott (pp. 74-82, 8 ref.). SP

103

Proceedings 1979. Cornell Nutrition Conference for Feed Manufacturers. October 30 and 31, November 1, 1979, Sheraton Motor Inn, Syracuse, New York. [Conference proceedings]

United States of America, Cornell University, New York State College of Agriculture & Life Sciences; United States of America, American Feed Manufacturers Association

125pp. (1979) [13 ref. En] Ithaca, New York, USA

Papers presented at this conference include the following: A study of the methionine requirements of laying hens (giving figures for egg production %, egg wt. and egg mass) by M. L. Scott (pp. 27-31, 3 ref.). Growth, feed efficiency and carcass characteristics of Angus and Holstein steers fed high or moderate energy rations to five slaughter weights, by M. L. Thonney, E. K. Heide, A. F. Y. Nour & D. L. Duhaime (pp. 76-85, 8 ref.). SP

104

[The carry-over of Pb, Cd and Hg in chickens.] Zum carry-over Verhalten von Blei, Cadmium und Quecksilber bei Hühnern. [Review]

Nezel, K.

Mühle + Mischfüttertechnik 117 (3) 30-32 (1980) [16 ref. De]

The distribution of Pb, Cd and Hg was determined in the tissues of broilers and hens after prolonged feeding with contaminated feeds, and also in eggs laid by the hens. The data are used to show the carry-over of these toxic metals into edible tissues and eggs. RM

105

[Occurrence and importance of antibiotics residues in foods.] Vorkommen und Bedeutung von Antibiotika-Rückständen in Lebensmitteln.

Terplan, G.; Zaadhof, K. J.; Angersbach, H.

Archiv für Lebensmittelhygiene 30 (6) 197-202 (1979) [many ref. De, en] (Inst. für Hygiene & Tech. der Lebensmittel tierischen Ursprungs der Univ. München, Schellingstrasse 10/III, 8000 Munich 40, Federal Republic of Germany)

This lecture discusses antibiotics residues in meat, milk and eggs, their origin, frequency of occurrence, resistance to processing and their importance. Stringent control measures have nearly eliminated antibiotics residues in meat and milk products (but not in eggs). The resistance of antibiotics to technological processes differs, penicillin and chloramphenicol being the most stable, followed by streptomycin. Tetracyclines are quickly inactivated. The toxicological effects of inactivated residues have not yet been clarified. RM

106

Improvements in packages for e.g. eggs.
Kohler Brothers Ltd.

South African Patent 78/4690 (1979) [En]

Rectangular package has ≥ 1 side adapted to provide an end loading aperture, and an unloading aperture is located in a face of the package at right angles to the loading aperture. A closure flap, which is hinged to the package and joined by a tear line along the entire periphery of the closure, has a medial hinge line, enabling the flap to be bent inward to present an upstanding display surface. W&Co

107

[Small pack for eggs.] Eierkleinpackung.
Ridder, K.

German Federal Republic Patent Application 2 819 203 (1979) [De]

Egg box consists of a humped base shaped to take eggs vertically and a cover made possibly from cardboard. The main box can be folded up from a sheet of plastics material into which the egg shapes have been moulded and the edges of which support the cardboard top. W&Co

108

Proceedings of the Maryland Nutrition Conference for Feed Manufacturers, March 16-17, 1978.
[Conference proceedings]

United States of America, University of Maryland; United States of America, Maryland Feed Industry Council Incorporated; United States of America, American Feed Manufacturers Association
iv + 120pp. (1978) [many ref. En] Maryland, USA; University of Maryland. Price \$1.50

Papers presented at the Maryland Poultry Nutrition Conference are given and include: The effects of ammoniated aflatoxin contaminated corn on domestic farm animals, by A. C. Keyl (pp. 11-18, 4 ref.) which discusses the possible transference of reaction products from the edible tissues of swine, cattle, poultry and eggs to human consumers. Calcium appetite in chickens, by W. J. Mueller, A. Pro-Martinez, I. G. Joshua & B. Lobaugh (pp. 82-87, 15 ref.) with data given for effects on egg wt. and shell thickness. The threatened status of growth promotants for livestock and poultry, by R. H. White-Stevens (pp. 87-101) which reviews effects of growth promotants on the human diets. Effects of monensin on performance and volatile fatty acids in ruminants, by E. C. Leffel (pp. 111-115, 21 ref.) with effects of monensin on carcass composition. SP

109

Staphylococcal enterotoxin B production in hard-boiled eggs.

Harbrecht, D. F.; Bergdoll, M. S.

Journal of Food Science 45 (2) 307-309 (1980) [En]
[Food Res. Inst., Univ. of Wisconsin, 1925 Willow Drive, Madison, Wisconsin 53706, USA]

Enterotoxin B was detected in hard-boiled eggs that were cooled in water containing $< 10^2$ colony forming units/ml *Staphylococcus aureus* strain FRI-947 and incubated at 37°C for 24 h. Factors affecting enterotoxin B production were the number of organisms in the cooling water, cooling time, egg temp. and length of time and temp. at which the eggs were held after cooling. Addition of 1% ovalbumin or conalbumin to 3% protein hydrolysate powder + 3% N-Z Amine NAK medium in flasks, incubated with shaking, increased enterotoxin B production by 10-30% but no enterotoxin was produced in ovalbumin or boiled egg white suspension alone. IFT

110

[Process and solution for preserving foods.]

Perry, D.

French Patent Application 2 413 044 (1979) [Fr]

A solution in which are immersed raw or cooked foods containing lipids, proteins and glucosides (particularly shelled hard-boiled eggs) consists of an aqueous solution containing an organic acid (vinegar at about 10 p.p.m.) and an alkali or alkaline earth salt ($\text{CaH}_4(\text{PO}_4)_2$, or possibly NaH_2PO_4 or KH_2PO_4 , at about 2-10 p.p.m.). W&Co

111

[Effects of the dwarf gene on acclimatization capacity of laying hens at high environmental temperatures.] Der Effekt des Dwarf-Gens auf das Akklimatisationsvermögen von Legehennen an hohe Umwelttemperaturen.

Horst, P.; Petersen, J.

Archiv für Geflügelkunde 43 (6) 242-245 (1979) [3 ref. De, en, fr, ru] [Inst. für Tierproduktion, Tech. Univ., 1000 Berlin 33]

A total of 1013 laying hens, including both normal and dwarf birds, was used in a comparative study on performance and egg quality; the hens were held at environmental temp. of 20° or 32°C. Tables of experimental data are given, including values for egg wt., shell strength, albumen height and proportion of yolk. Genotype/environmental temp. interactions are discussed in detail. AJDW

112

[Effect of crossing egg-laying lines on morphological characteristics of eggs.]

Nozhchev, S.; Sharlanov, D.; Kunev, K. I.

Zhivotnov'dni Nauki 15 (5) 68-72 (1978) [14 ref. Bg, ru, en] [Khibriden Tsent'r po Pitsev'dstvo, Stara Zagora, Bulgaria]

During March 1976, 3 eggs each from 30 layers in single-hatch groups of 160 (i) Ivaya M, (ii) Eniya, (iii) Ivaya M \times Eniya, and (iv) Eniya \times Ivaya M lines at the

Stara Zagora Centre were examined, wt., shape, wt. and proportions of shell, egg white and egg yolk, proportions of thick and thin white, and yolk colour being determined. It is concluded from mean values with s.e. tabulated for all characteristics studied that (ii) should be used as the maternal line in commercial hybrid production, as it improved egg quality characteristics. SKK

113

Safety of feeding aflatoxin-inactivated corn to White Leghorn layer-breeders.

Hughes, B. L.; Barnett, B. D.; Jones, J. E.; Dick, J. W.; Norred, W. P.

Poultry Science 58 (5) 1202-1209 (1979) [11 ref. En] [Poultry Sci. Dep., Clemson Univ., Clemson, S. Carolina 29631, USA]

A 2-yr study was conducted to determine the safety of feeding corn which had been ammoniated to inactivate aflatoxins. Ammoniated aflatoxin-contaminated corn had no significant effect on shell thickness, Haugh units, % blood spots, or % meat spots. Aflatoxins in feed corn at 0.5 p.p.m. also had no deleterious effect upon egg quality parameters, except an increase in blood spotting in 1 of 2 trials. JRR

114

Effect of restriction of water on certain production characteristics of caged layers.

Jalaludeen, A.; Ramakrishnan, A.; Venugopal, C. K. *Indian Veterinary Journal* 56 (10) 839-843 (1979) [10 ref. En] [Dep. of Poultry Sci., Coll. of Vet. & Anim. Sci., Kerala Agric. Univ., Mannuthy, Trichur, India]

36 Single Comb White Leghorn pullets, 22 wk of age at the start of the trial, were used in a study on effects of restriction of the water supply on laying performance and egg quality. Treatments tested were: (i) water provided for 4 h/day, i.e. from 8 a.m. to 10 a.m., and from 12 noon to 2 p.m.; (ii) water provided for 4 h/day, from 10 a.m. to 2 p.m.; and (iii) water provided ad lib. Daily records were kept of egg production, feed efficiency, etc. for five 28-day periods; egg quality was evaluated over the last 3 days of each 28-day period. A table of results is given. Mean values for egg quality characteristics were, for treatments (i), (ii) and (iii), resp.: egg wt. 49.19, 49.02 and 51.51 g; % shell 19.40, 19.76 and 19.74; % thin albumen 29.21, 28.64 and 29.06; % thick albumen 31.85, 31.86 and 32.24; % total albumen 61.06, 60.50 and 61.30; and % yolk 27.89, 28.07 and 27.27. Only the difference in egg wt. was statistically significant. AJDW

115

[Use of linseed extraction meal in feeding of poultry.] Der Einsatz von Leinextraktionsschrot im Geflügelfutter.

Vogt, H.; Stute, K.; Harnisch, S.; Krieg, R.; Torges, H.-G. *Archiv für Geflügelkunde* 43 (4) 150-159 (1979) [37 ref. De, en, fr, ru] [Inst. für Kleintierzucht, Bundesforschungsanstalt für Landwirtschaft Braunschweig-Völkenrode, Celle, Federal Republic of Germany]

Studies were conducted on effects of dietary linseed extraction meal (LEM) on performance and feed

efficiency of broilers and laying performance and egg quality of hens. Tables of results are given. Feeding LEM to broilers at concn. over the range 2.5-15.0% depressed wt. gain and feed efficiency. Feeding 3-12% LEM to laying hens tended to reduce egg wt.; this effect could be counteracted by supplementation of the diet with lysine. No adverse effect of dietary LEM on egg quality (% cracked eggs, breaking strength, shell elasticity, shell thickness, yolk index, albumen index, yolk colour, foaming characteristics, flavour and aroma) was observed. AJDW

116

[Use of sweet lupin meal in the diet of poultry.] Der Einsatz von Süßlupinenschrot im Geflügelfutter.

Vogt, H.; Harnisch, S.; Krieg, R.

Archiv für Geflügelkunde 43 (6) 229-238 (1979)

[41 ref. De, en, fr, ru] [Inst. für Kleintierzucht, Bundesforschungsanstalt für Landwirtschaft Braunschweig-Völkenrode, Celle, Federal Republic of Germany]

This paper includes tables of data for performance characteristics of broilers fed diets with $\leq 30\%$ 'Popular' var. lupin seed meal for 7 wk, and for the laying performance and egg quality of hens fed diets containing $\leq 24\%$ 'Popular' or 'Sulfa' var. lupin seed meal. Values are included for the proportion of cracked eggs, breaking strength, deformation value, shell thickness, yolk index, albumen index, foam index, foam stability, and colour. The diet with 24% 'Popular' lupin seed meal gave significantly inferior shell strength to the control diet. Significant differences in yolk colour were observed among the groups receiving lupin seed meal; however, no significant differences in yolk colour from the control group were observed. No other significant effects of dietary lupin seed meal on egg quality were observed. AJDW

117

[Effects of hen strain and egg storage on egg quality, especially proteins of the thin and thick albumen.]

Herkunfts- und Lagerungseinflüsse auf die innere Eiqualität, insbesondere die Proteine im dünnen und dicken Eiklar.

Scholtyssek, S.; El-Bogdady, A.

Archiv für Geflügelkunde 43 (6) 245-252 (1979)

[15 ref. De, en, fr, ru] [Lehrstuhl für Kleintierzucht, Univ. Hohenheim, 7000 Stuttgart 70, Federal Republic of Germany]

Eggs laid by hens of 3 strains (Shaver, Hisex, LSL) were stored for 2, 9 or 16 days at 5°C or 19°C. Quality characteristics (wt. loss, albumen height, yolk index, % shell, % yolk, % total albumen, % thick albumen, % thin albumen, pH, and contents of individual protein fractions in the thin and thick albumen) were determined for the stored eggs. Tables of results are given. All 3 variables significantly influenced all the quality characteristics studied. The results are discussed in detail, with special reference to differences in protein fraction concn. in the albumen. Eggs laid by the 3 hen strains differed in the ovomucoid, ovalbumin and lysozyme contents of the albumen. Thin and thick albumen differed in protein fraction concn. Ovalbumin and conalbumin concn. increased and lysozyme concn. decreased with increasing storage time. Storage at 5°C gave higher ovalbumin 2 and lower conalbumin concn.

than storage at 19°C. Storage time \times temp. interaction significantly influenced concn. of most albumen protein fractions. AJDW

118

[Effects of handling, packaging and storage on egg quality.] Die Beeinflussung der Eiqualität durch Technik und Bearbeitung.
Scholtyssek, S.

Archiv für Geflügelkunde 43 (4) 175-179 (1979) [3 ref. De, en, fr, ru] [Lehrstuhl für Kleintierzucht, Univ. Hohenheim, 7000 Stuttgart 70, Federal Republic of Germany]

Studies were conducted on egg quality at large poultry farms. Eggs were sampled at 4 sites: (i) in the laying cages; (ii) at the end of the egg-collection conveyor for individual rows of cages; (iii) at the end of the main collection conveyor, and (iv) after grading. Data are given for the proportion of damaged eggs, proportion of dirty eggs and shell elasticity of eggs collected at these 4 sites. Overall, only 72% of eggs were free from damage; the proportion of damaged eggs increased from (i) to (iv). The proportion of lightly-cracked eggs was appreciably higher for (ii)-(iv) than for (i); proportion of broken eggs was significantly lower for (iii) and (iv) than for (i) and (ii). Proportion of dirty eggs decreased sharply from (i) to (ii), gradually thereafter. Shell elasticity did not differ significantly between sampling locations. Preliminary studies showed a total aerobic count of 3370/egg for (i), 10 530/egg for (iv). Studies on packaging and transport of eggs were conducted at 10 farms. The results show an average of 3.35% cracked or broken eggs (range 2.22-4.99%) after packaging, and 5.3% cracked or broken eggs (range 3.42-8.43%) after transport. Large eggs had a higher incidence of damage during packaging and transport than small eggs. AJDW

119

Effect of egg storage position on consumer quality attributes of shell eggs.

Cardetti, M. M.; Rhorer, A. R.; Stadelman, W. J.
Poultry Science 58 (5) 1403-1405 (1979) [12 ref. En] [Dep. of Anim. Sci., Purdue Univ., W. Lafayette, Indiana 47907, USA]

The purpose of this study was to determine the effect of storing cartoned shell eggs in the vertical as opposed to the horizontal position on the albumen quality as well as the candled and broken out appearance of shell eggs. To increase credibility of data 2 separate investigations were conducted. In addition to investigating the above variable, the difference between eggs small-end-up vs. small-end-down was examined. Results indicated that there were no significant differences in Haugh units or candled appearance between eggs stored small-end-up and eggs stored small-end-down; however, the yolk was better centered in eggs stored small-end-up. Storing eggs in the horizontal position for 3 wk as opposed to storing eggs for 3 wk in the vertical position resulted in better yolk centering, regardless of whether the small end was up or down. AS

120

[Effects of various pack types on quality of stored eggs.] Der Einfluss verschiedener Verpackungsarten auf die Qualität von gelagerten Eiern.

Scholtyssek, S.; Raber, A.

Archiv für Geflügelkunde 43 (5) 205-209 (1979) [2 ref. De, en, fr, ru] [Lehrstuhl für Kleintierzucht, Univ. Hohenheim, 7000 Stuttgart 70, Federal Republic of Germany]

720 fresh eggs of the wt. class 60-65 g were used in a $4 \times 2 \times 3$ factorial storage trial conducted to evaluate effects of pack type (12-egg wood pulp pack, 10-egg wood pulp pack, 10-egg expanded polystyrene pack, or 10-egg transparent plastics pack), storage temp. (room temp. or 5°C) and storage period (2, 9 or 16 days) on egg quality. Tables of data are given for air cell size, wt. loss, albumen height and yolk index of the stored eggs, together with analyses of variance, and correlations between the egg characteristics studied. Effects of pack type on quality retention were small; wt. loss was greater in the wood pulp than in the plastics packs. Storage temp. and duration were the main factors influencing quality retention. The air cell size was clearly correlated with wt. loss, but was not closely related to indices of internal quality of the eggs. AJDW

121

[Survey of the methods for long-term storage of poultry eggs. XVII. The effects of washing and coating materials, vegetable oil, mineral oil and sucrose-fatty acid ester emulsion, on interior quality of chicken eggs.]

Tanabe, H.; Ogawa, N.

Japanese Poultry Science [Nihon Kakin Gakkai-shi] 16 (4) 190-199 (1979) [7 ref. Ja, en] [Dep. of Human Nutr. & Food Sci. Gifu Women's Coll., Taromaru, Gifu, 501-25 Japan]

The effects of washing and coating materials on interior quality of hens' eggs were studied. Eggs were divided into 8 treatment groups: unwashed and uncoated; washed and uncoated; unwashed and corn oil coated; washed and corn oil coated; unwashed and liquid paraffin coated; washed and liquid paraffin coated; unwashed and 2.0% sucrose-fatty acid ester emulsion coated; and washed and 2.0% sucrose-fatty acid ester emulsion coated. Eggs were kept at 25°C for 1, 3, 5, 7, 9, 11 and 13 wk, and broken for measurement of interior quality. Regression equations between storage time and the egg quality (Haugh units, yolk height and wt. loss) were obtained. Similar equations were obtained with washed and unwashed eggs coated with the same material, except for the equations between storage time and wt. loss in sucrose-fatty acid ester emulsion-coated groups. Coating with corn oil or liquid paraffin was much more effective than coating with sucrose-fatty acid ester emulsion for retention of interior quality of eggs for 13 wk. [See FSTA (1979) 11 4Q50 for part XI.] AS

122

Drug excretion into eggs. An autoradiographic study. [Lecture]

Blom, L.

Archives of Toxicology Suppl. 1, 255-257 (1978) [5 ref. En] [Nat. Food Inst., 19, Mørkøj Bygade, DK-2860 Soborg, Copenhagen, Denmark]

Whole-body autoradiographic studies were performed to illustrate distribution patterns of [^{14}C]trimethoprim, [^3H]tetracycline and [^{14}C]urea in quails. [^{14}C]urea was evenly distributed throughout the oviduct, except for higher concn. at the Isthmus (shell membrane forming region). [^3H]tetracycline was localized mainly in the uterus (shell forming region). The distribution pattern of [^{14}C]trimethoprim along the oviduct supported passive diffusion of drug into albumen across the oviductal epithelium at the 3 regions of different pH, Magnum, Isthmus and Uterus. The observations explain results of previous studies of concn. of drugs in egg yolk. [See FSTA (1980) 12 7A448.] DIH

123

Effects of dietary whole egg and/or exercise on serum cholesterol, triglycerides and lipoprotein cholesterol distribution in male subjects.

Hill, J. E.

Dissertation Abstracts International, B 40 (5) 2128: Order no. 79-25371, 155pp. (1979) [En] [Virginia Polytechnic Inst. & State Univ., Blacksburg, Virginia 24061, USA]

A study conducted over a 4 wk period with a total of 42 men aged 30-53 yr indicated that the addition of ≤ 4 eggs/day to the normal diets of either active (running ≥ 25 miles/wk) or sedentary men did not significantly ($P > 0.05$) change the levels in serum of total cholesterol, triglycerides, high density lipoprotein cholesterol, low density lipoprotein cholesterol or very low density lipoprotein cholesterol. JA

124

Effect of dietary levels of calcium on performance of pullets and layers, physical characteristics of the egg, and calcium and phosphorus in plasma and bone.

El-Boushy, A. R.; Papadopoulos, M. C.

Netherlands Journal of Agricultural Science 27 (4) 305-312 (1979) [25 ref. En] [Dep. of Poultry Husbandry, Agric. Univ., 6700 AH Wageningen, Netherlands]

432 pullets of a medium-heavy breed, 16 wk of age at the start of the experiment, were used in a study on effects of dietary Ca level on wt. gain, laying performance, egg quality, and Ca and P levels in plasma and bone. All 9 combinations of 3 dietary Ca levels (1.5, 3.7 or 5.0%) during the pre-laying and laying phases were tested. Tables of results are given, including data for shell thickness, sp. gr., shell %, yolk index and albumen index. The results show that shell thickness, sp. gr. and % shell increased significantly with increasing dietary Ca level; no significant effect of dietary Ca level on yolk index or albumen index was observed. AJDW

125

Gas-liquid chromatographic determination of mirex and photomirex in the presence of polychlorinated biphenyls: interlaboratory study.

Norstrom, R. J.; Won, H. T.; Hove Holdrinet, M. van;

Calway, P. G.; Naftel, C. D.

Journal of the Association of Official Analytical Chemists 63 (1) 37-42 (1980) [20 ref. En] [Environment Canada, Nat. Wildlife Res. Cent., Ottawa, Ontario K1A 0E7, Canada]

Mirex and photomirex (8-monohydromirex) were separated from polychlorinated biphenyls (PCB) and other aromatic compounds by nitration with fuming HNO_3 /conc. H_2SO_4 and removal of nitro-PCB on an alumina microcolumn; the compounds were then determined by GLC. Recoveries of mirex and photomirex were 102 ± 8 and $104 \pm 5\%$, resp., from standard solutions which had a PCB-to-mirex and photomirex ratio of 1000. Recoveries from fortified, uncontaminated samples of sediment, fish, and eggs averaged 93 ± 7 and $92 \pm 3\%$ for mirex and photomirex, resp. The coeff. of variation for repeatability and reproducibility averaged 8 and 15%, resp., in an interlaboratory study conducted by 4 laboratories using extracts of naturally contaminated substrates (sediment, carp, eel, and gull egg). Levels of mirex in the samples ranged from 0.1 to 8 mg/kg, and levels of PCB ranged from 0.5 to 166 mg/kg. AS

126

A method for the quantitative estimation of cholesterol α -oxide in eggs.

Tsai, L. S.; Ijichi, K.; Hudson, C. A.; Meehan, J. J. *Lipids* 15 (2) 124-128 (1980) [20 ref. En] [W. Reg. Res. Cent., Sci. & Education Administration, USDA, Berkeley, California 94710, USA]

A method for the quantitation of cholesterol α -oxide in egg and egg products is described. Total lipids extracted from dry egg samples were fractionated on a silicic acid column to concentrate cholesterol oxides which were then quantitatively determined by GLC. Those samples which showed cholesterol oxides by GLC were further analysed by HPLC for the ratio of cholesterol α -oxide and cholesterol β -oxide. Cholesterol α -oxide content was calculated from the combined results of GLC and HPLC. AS

127

Non-destructing eggshell egg contents remover.

Reed, W. H.

United States Patent 4 182 234 (1980) [En]

The apparatus has a cup receptacle having a soft, resilient concave recess for receiving an egg. Protruding through the bottom of the receptacle is a pair of tubes - an egg contents discharge tube for receiving the extracted contents of the egg and an air inlet tube for forcing compressed air into the egg. HB

128

How to minimise egg damage with mechanised collection.

Toleman, W. J.

Poultry International 17 (7) 149, 150, 152, 154, 156 (1978) [En, de, fr, it, es] [Cornell Univ., Ithaca, New York 14850, USA]

Factors influencing cracking and breakage of eggs during mechanized collection and packaging are discussed, with reference to: stair-step vs. flat deck cage systems; the need to avoid changes in level with consequent rolling of the eggs and impact damage; use

of plastics foam or tube 'egg bumpers' to minimize damage by impact against equipment; removal of obstructions from egg channels, etc.; problems with excessive egg flow in confined sections; damage to eggs passing around corners of conveyor systems; and damage in automatic packing systems. AJDW

129

Use of field beans (*Vicia faba* L.) and peas (*Pisum sativum*) in laying-hen and growing-chicken diets. [Lecture]

Guillaume, J.

[Publication] *Commission of the European Communities* EUR 5686; 217-231 (1977) [En] [Sta. de Recherches Avicoles, INRA, Cent. de Tours-Nouzilly 37380, Monnaie, France]

A series of experiments was carried out in order to study the feeding value of field beans and garden peas in broiler and laying hen rations. Diets were well balanced, especially in respect to metabolizable energy, protein, lysine and 5 amino acids, and were fed either for a short or long duration. Effects of antinutritional factors in field beans and garden peas (antinutritional α -galactosides and tannins) on several characteristics including egg quality (vitellus wt., vitellus:egg wt. ratio, shell wt., shell index) were emphasized by the study and results are tabulated for all trials. [See FSTA (1980) 12 8G586.] SP

130

The use of rapeseed meal produced from a rape sort low in eruca acid and glucosinolate in poultry feeding. [Lecture]

Vogt, H.

[Publication] *Commission of the European Communities* EUR 5686; 282-289 (1977) [5 ref. En] [Inst. for Poultry & Small Anim. Sci. of the FAL, Celle, Federal Republic of Germany]

In layer tests carried out in 1973 and 1975/1976, effects of feeding isonitrogenous and isoenergetic diets containing (i) 0 or (ii) 15% rapeseed meal to birds were studied. In a similar trial, birds were fed diets containing (iii) 0, (iv) 7.5 or (v) 15% of cv. Erglu (a low erucic acid and glucosinolate containing var.) rapeseed meal or (vi) 15% cv. Lesira rapeseed meal. Eggs of (i) and (ii) were organoleptically evaluated and results for smell for white shelled eggs were: (i) 85% good, 13% medium and 2% bad, and (ii) 65%, 32% and 3%, resp.; and for brown shelled eggs, (i) 65%, 33% and 2%, and (ii) 61%, 20% and 19%, resp. Results for taste for white shelled eggs were: (i) 88% good and 12% medium, and (ii) 68% good and 32% medium; and for brown shelled eggs, (i) 62% good, 35% medium and 3% bad, and (ii) 54% good, 30% medium and 16% bad. Organoleptic evaluations for eggs of (iii) - (vi) with brown shells were, resp.: smell, 98% good + medium and 2% bad, 90 and 10%, 74 and 26%, and 80 and 20%; and taste, 98% good + medium and 2% bad, 87 and 13%, 76 and 24%, and 90 and 10%. Results are discussed. [See FSTA (1980) 12 8G586.] SP

131

Spectrophotometric determination of microgram amounts of calcium in waters and foods using diphenylglyoxal bis(2-hydroxybenzoyl hydrazone). Silva, M.; Valcarcel, M.

Analyst 105 (1248) 193-202 (1980) [39 ref. En] [Dep. of Analytical Chem., Fac. of Sci., Univ. of Cordoba, Cordoba, Spain]

The synthesis, characteristics and analytical applications of diphenylglyoxal bis(2-hydroxybenzoyl hydrazone) are described. This compound reacts with calcium(II) at pH 12 to produce a yellow complex ($\lambda_{\text{max}} = 432 \text{ nm}$, $\epsilon = 1.76 \times 10^4 \text{ l mol}^{-1} \text{ cm}^{-1}$); another complex (1:1) can be detected at pH 7.80. Dipyrityl glyoxal bis(2-hydroxybenzoyl hydrazone) also reacts with Ca and both reagents are compared. A sensitive and selective spectrophotometric method is proposed for detn. of Ca using diphenylglyoxal bis(2-hydroxybenzoyl hydrazone). Interferences have been investigated and when masking agents are added common cations do not interfere. The yellow calcium(II) complex was used for detn. of Ca in mineral water, orange juice, beer, egg white and yolk, milk and cheese. The results are compared with those obtained using glyoxal bis(2-hydroxyanil). AS

132

Ion-exchange derivatives of Spheron. III. Carboxylic cation exchangers.

Mikes, O.; Strop, P.; Smrz, M.; Coupek, J.

Journal of Chromatography 192 (1) 159-172 (1980) [16 ref. En] [Inst. of Organic Chem. & Biochem., Czechoslovak Acad. of Sci., 166 10 Prague 6, Czechoslovakia]

Weakly acid cation-exchange derivatives of the glycol-methacrylate macroreticular gel Spheron 300 were prepared by carboxymethylation, succinylation and oxidation. The use of the latter method was also attempted in the preparation from the more macroporous Spheron 1000. Carboxymethyl derivatives were prepared with 4 nominal capacities for small ions: 0.26, 0.50, 1.02 and 2.20 m-equiv./g. The ion-exchange samples thus prepared were characterized by physico-chemical methods. The samples, including a natural mixture of egg proteins, were tested by chromatographic separation experiments. Equipment used in the medium-pressure chromatography of proteins and a dynamic method for detn. of protein sorption on the chromatographic column are described. The comparatively large differences between the detn. of protein capacity using the dynamic and static (batch) methods are explained by means of a hypothesis assuming multiple sorption of proteins in batch experiments. The possibility of applying this HPLC method in protein analysis, e.g. in food technology, is discussed. AS

133

Protein digestibility of the same protein preparations by human and rat assays and by in vitro enzymic digestion methods.

Bodwell, C. E.; Satterlee, L. D.; Hackler, L. R.

American Journal of Clinical Nutrition 33 (3) 677-686

(1980) [33 ref. En] [USDA, Room 313, Building 308, BARC-East, Beltsville, Maryland 20705, USA]

The apparent and true digestibilities of preparations of 6 proteins (spray dried whole egg, Cottage cheese, canned tuna, groundnut flour, soybean isolate, and wheat gluten) were estimated. For protein sources containing both plant and animal protein, use of the in vitro enzymic procedures would give only an approx. estimate of digestibility in humans. AS

134

[TLC determination of 6,6'-ethylene-bis(2,2,4-trimethyl)1,2-dihydroquinoline (XAX-M) in foods of animal origin. I. Eggs and fish.]

Dünnschichtchromatographische Bestimmung von 6,6'-Äthylen-bis(2,2,4-trimethyl)1,2-dihydrochinolin (XAX-M) in tierischen Lebensmitteln. I. Eier und Fisch. Rödel, I.

Nahrung 23 (5) 567-569 (1979) [De] [Bezirks-Hygiene-Inspektion & -Inst., Berlin]

3 egg yolks or 50 g homogenized fish are extracted with 50 ml acetone. After freezing at -20° to -30°C , the residue is separated from the extract by filtration, and the solvent is evaporated off. The extract is then purified by hexane/acetonitrile partition. The acetonitrile extract is then concentrated and separated by TLC on silica gel G (using an acetone/benzene/n-heptane 1:1:3 solvent system), XAX-M flecks being detected by spraying the chromatogram with 2% FeCl_3 in 1N H_2SO_4 . XAX-M concn. is evaluated by comparison with standards. Detection limit is 0.1 μg ; recovery (for 200 μg added XAX-M) is 80% for both foods. [See following abstr. for part II.] IN

135

Semi-automatic method for the determination of total iodine in food.

Moxon, R. E. D.; Dixon, E. J.

Analyst 105 (1249) 344-352 (1980) [21 ref. En] [Lab. of Gov. Chem., Cornwall House, Stamford Street, London SE1 9NQ, UK]

A simple method for detn. of total I in food, based on the catalytic destruction of thiocyanate by nitrite in the presence of iodide, has been evaluated and the colorimetric finish technique automated. Optimum conditions for destruction of organic matter and liberation of I were investigated and a set of conditions applicable to the automated finish technique developed. The method, when applied to 160 foods, had a precision of about 10%, a detection limit for iodine of 1 $\mu\text{g}/100\text{ g}$ food, a mean recovery of added iodide of 90% and an output of about 70 samples/wk. The effect of storage conditions on the I content of fish and eggs was also examined, and the effect of some possible interfering substances, e.g. chloride, bromide and Hg, investigated. AS

136

Metabolic fate of the herbicide buthiazole in lactating cows and laying hens.

Atallah, Y. H.; Yu, C. C.; Whitacre, D. M.

Journal of Agricultural and Food Chemistry 28 (2) 278-286 (1980) [2 ref. En] [Res. & Development Dep.,

Velsicol Chem. Corp., Chicago, Illinois 60611, USA]

[^{14}C]Buthiazole [3-(5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2- ^{14}C -yl)-4-hydroxy-1-methyl-2-imidazolidinone] was administered in twice-daily oral doses for 14 consecutive days to cows at dosages equivalent to 0.5, 2.5, and 10 p.p.m., in the diet and to hens at dosages equivalent to 0.3, 1.5, and 6 p.p.m. in the diet. Within 12 h of the final [^{14}C]buthiazole dose, 80% of total administered ^{14}C was excreted in cow urine, 8% in faeces, and 1% in milk; 82% was eliminated in hen excreta. Residues, as a function of dietary concn., were about 1.4% for milk, 0.4% for eggs, 2% for cow muscle, and 0.2% for hen muscle. No residue was detected in milk, eggs, or tissues 7 days after treatment ceased. AS

137

[Residues of the coccidiostat amprolium in meat and eggs.] Rückstände des Coccidiostatikums Amprolium in Fleisch und Eiern.

Petz, M.; Thier, H.-P.; Vogt, H.

Zeitschrift für Lebensmittel-Untersuchung und -Forschung 170 (5) 329-333 (1980) [9 ref. De, en] [Inst. für Lebensmittelchem. der Univ. Münster, Piusallee 7, D-4400 Münster, Federal Republic of Germany]

A simple and rapid gas chromatographic procedure for the residue analysis of the coccidiostat amprolium in muscle tissue, organs and eggs is described. The quaternary compound is cleaved by an excess of sulphite, yielding 2-methylpyridine which is detected by gas chromatography using the nitrogen-selective thermionic detector. Amprolium added to eggs and poultry meat at levels between 0.01 and 1.0 mg/kg was recovered quantitatively and with very high reproducibility. Results are given for residues found in eggs and meat of laying hens fed with amprolium and for commodities purchased locally. AS

138

Designing shell egg grading and packing plants. Goble, J. W.

Marketing Research Report, USDA No. 1105, 32pp. (1979) [2 ref. En] [SEA, Beltsville Agric. Res. Cent., Beltsville, Maryland 20705, USA]

This report discusses general principles of plant layout design; methodology useful to a shell egg packing firm for analysing and determining its facility requirements; layouts and operational procedures, designed for typical firms, to demonstrate how individual facility requirements may be satisfied; and some benefits resulting from adequate layout planning (optimum space allocation, straight product flow, easy sanitation and refrigeration, provision for modern material-handling equipment). A data collection form, and analysis of facility needs for a firm are appended. RM

139

[Blank for making packages with mechanical closures.]

Barnouin, R.

French Patent Application 2 418 157 (1979) [Fr]

Low cost packaging is formed from cut-out blanks which fold up to form a box or e.g. a pack for cartons of eggs. W&Co

140

Egg processing.

Moulds, F. G.; McCord, M. A. (Diamond International Corp.)

United States Patent 4 189 898 (1980) [En]

A process is described in which eggs moving on rollers of an endless chain conveyor are oriented and caused to fall into a receiving receptacle larger end first, after which the receptacle is rotated such that the eggs can be transferred to receiving means, narrow end downwards. IFT

141

[Animal protein-free feed mixtures for laying hens.]

Sentek, W.; Kaniok, R.; Roskosz, S.

Roczniki Naukowe Zootechniki 6 (2) 205-216 (1979)

[14 ref. Pl, en, ru] [Zaklad Hodowli Drobiu Inst. Zootech., Balice k. Krakowa, Poland]

4 groups of 260 Leghorn laying hens were used in a 3-month feeding trial on diets containing (i) 28% soybean meal; (ii) 18% soybean meal + 10% lupin seed meal + 0.2% methionine + 0.1% lysine; (iii) 14% soybean meal + 14% lupin seed meal + amino acids as in (ii); and (iv) 17% soybean meal. Diet (iv) was fed alone; the other 3 diets were fed as blends containing 20% corn, 15% wheat and 65% (i), (ii) or (iii). Tables are given of data for laying performance, fertility and hatchability, and egg quality (average wt, sp gr., shell strength, shell thickness, % shell, Haugh score, yolk index, yolk colour, and incidence of meat spots and blood spots). Diet (i) gave significantly lighter eggs and lower egg sp. gr. than (iii) or (iv), and significantly lower shell strength than (iv). (iv) had significantly higher yolk colour score (Roche scale) than (i), (ii) or (iii). Diet did not significantly influence the other egg characteristics studied. AJDW

142

[Isoelectric focusing of purified chicken ovomucoid.]

Ibuki, F.; Kanamori, M.

Scientific Reports of the Kyoto Prefectural University, Agriculture [Kyoto-furitsu Daigaku Gakujutsu Hokoku, Nogaku] 29, 95-100 (1977) [10 ref. Ja, en] [Lab. of Nutr. & Food Chem., Fac. of Agric., Kyoto Prefectural Univ., Kyoto, Japan]

Purified hens' egg ovomucoid was fractionated by isoelectric focusing; 6 fractions were isolated, with pI values of (i) 3.52, (ii) 3.85, (iii) 4.00, (iv) 4.15, (v) 4.35 and (vi) 4.50. Peak (i) could not be detected in deflavo-ovomucoid. Trypsin inhibition activity was detectable in fractions (i), (ii), (iii) and (iv), but not fractions (v) and (vi). Flavin binding ability was present only in fractions (iv), (v) and (vi). [From En summ.] AJDW

143

Storage of shelled hard-boiled eggs packaged in a carbon dioxide enriched atmosphere. [Lecture]

Rosset, R.; Lebert, F.; Ochin, N.; Lafon, J. F.; Cauquelin, Y.

Bulletin de l'Institut International du Froid 59 (4) 1158-1161 Abstr. C2-116 (1979) [En, Fr] [Cent. Nat. d'Etudes & de Recherches pour l'Alimentation

Collective, 75006 Paris, France]

The supply of shelled hard-boiled eggs for catering establishments and restaurants would be very welcome. Industrial cooking and shelling procedures were studied, behaviour of shelled eggs under different conditions was observed, and various storage technologies are proposed, especially packaging in a CO₂-enriched atm, under hygienic conditions, and appropriate chilling. In such optimal conditions, shelled hard-boiled eggs can be stored for several wk at 0°C, + 3°C, while maintaining their microbial and organoleptic qualities. [See FSTA (1980) 12 9G615.] AS

144

Mycotoxin residues in body fluids and tissues of food-producing animals. (In 'Abstracts of the XII International Congress of Microbiology' [see FSTA (1980) 12 10B73]) [Lecture]

Patterson, D. S. P.

p. 59 (undated) [En] [Cent. Vet. Lab., Weybridge, Surrey, UK]

The public health hazard of mycotoxin residues in milk, eggs and tissues of food-producing animals is discussed. Assessments of relative hazards to man of direct and indirect exposure to mycotoxins, and effectiveness of current regulatory control measures are considered. MEG

145

Dynamics of benzene hexachloride (BHC) isomers and other chlorinated pesticides in the food chain and in human fat.

Szokolay, A.; Rosival, L.; Uhnak, J.; Madaric, A.

Ecotoxicology and Environmental Safety 1 (3) 349-359 (1977) [9 ref. En] [Res. Inst. of Hygiene, Bratislava, Czechoslovakia]

During the period 1971-1974, contents of chlorinated pesticides were measured in 3 regions of Slovakia in oil, water, butter and eggs, and in human milk and adipose tissue, and total daily diets. Results indicate that there was a greater transfer of HCH isomers than of DDT and DDE from soil to potatoes, whereas eggs contained more DDT and DDE and less lindane and β -HCH than poultry feed. Milk fat contained about the same amount of total HCH as DDT (approx. 0.07 mg/kg). Human diet samples, analysed during the 1 yr period, had a higher mean content of DDT (0.03 mg/kg) than of DDE (0.012 mg/kg); total HCH content was approx. 0.011 mg/kg, with lindane present in highest amount (0.005 mg/kg). Human milk had a high content of DDT and DDE (2.287 and 4.497 mg/kg fat resp.) and lower amounts of β -HCH, lindane, α - and δ -HCH (0.5, 0.35, 0.1 and 0.1 mg/kg fat resp.). Results are discussed in terms of the accumulation of different pesticides in plant and animal tissues, and especially the high intake of DDT and HCH by breast-fed infants. MEG

146

Selenium content of foods grown or sold in Ohio.

Moxon, A. L.; Palmquist, D. L.

Ohio Report on Research and Development 65 (1)

13-14 (1980) [En] [Dep. of Anim. Sci., Ohio Agric. Res. & Development Cent., Wooster, Ohio, USA]

(i) Effects of added Se to diets of beef and dairy cattle, lamb, poultry and swine on Se content of some meat and animal products were studied. (ii) Se contents of a wide variety of foods available for purchase from grocery stores and supermarkets or produced locally in NE Ohio were also studied for Se content. In experiment (i), pork muscle, beef liver, lamb muscle, beef muscle, milk (whole fresh), egg yolks, eggs whole, and turkey breast from animals without added Se in diets or with 0.1 p.p.m. Se added to diets were sampled. Results were resp. (without and with added Se in diets) 0.039 and 0.082, 0.630 and 0.880, 0.045 and 0.069, 0.023 and —, 0.008–0.010 and 0.011–0.017, 0.031 and 0.038, 0.065 and 0.120 and 0.038 and 0.05 p.p.m. Food products analysed for Se content in experiment (ii) are tabulated, the list covers fruits and vegetables, animal products, hard wheat products, soft wheat products, other cereal products and miscellaneous foods. SP

147

[Performance of laying hens of various genotypes in relation to feed regime during the rearing and laying periods.] Leistungen von Legehennen verschiedener Genotypen bei unterschiedlicher Ernährung in der Aufzucht- und Legeperiode.

Richter, G.; Jeroch, H.; Gruhn, K.; Högel, E. *Archiv für Tierzucht* 22 (6) 431–439 (1979) [15 ref. De, en, ru] [Sektion Tierproduktion & Veterinärmed., Karl-Marx-Univ. Leipzig, 69 Jena, German Democratic Republic]

Groups of laying hens of 6 White Leghorn genotypes were used in a study on effects of genotype and feed regime on growth and laying performance. 2 diets were tested, one with normal and one with reduced protein and essential amino acid concn. A table of data is given showing breaking strength, shell thickness, albumen height and yolk height of eggs laid by the hens. Diet had no significant effect on the egg characteristics studied. Genotypes differed in breaking strength of the eggs, but not in the other egg quality characteristics studied. AJDW

148

The effects of restricted feeding and energy content of the ration on the performance of broiler breeding chickens.

Robblee, A. R.; Clandinin, D. R.; Darlington, K.; Milne, G. R.

Canadian Journal of Animal Science 59 (3) 539–544 (1979) [8 ref. En, fr] [Dep. of Anim. Sci., Univ. of Alberta, Edmonton, Alberta T6G 2E3, Canada]

In 1975 and 1976, 800 Hubbard female chicks + 125 White Mountain male chicks and 800 Shaver female chicks + 125 White Mountain male chicks resp., were reared on a restricted feeding regimen, a skip-a-day programme, at 26 wk of age. Treatments consisted of feeding either (i) a high energy, corn based ration, or (ii) a lower energy, wheat-based ration to each strain of pullets on either a free-choice or restricted basis, for 36 wk. Results show that restricted feeding of either (i) or (ii) reduced significantly the feed required to produce

a dozen eggs than when the rations were fed ad lib. The Hubbard stock produced significantly larger eggs than the Shaver strain on both restricted and full feeding programmes. In the Hubbard strain egg size in the restricted groups was significantly lower than in the full-fed groups. SP

149

You can do something about small egg size.

North, M. O.

Poultry International 18 (9) 70, 72, 74, 76, 95, 97 (1979) [En, de, it, es, fr, ja, ar]

Problems with marketing of small eggs are discussed. The potential for minimizing the proportion of small eggs is considered, with reference to factors influencing egg size, including body size of the hen, stage in the laying cycle, variation between hens, sequence of eggs within a clutch, genetic aspects, hen age, moulting, season, environmental temp., dietary linoleic acid, amino acid nutrition, veterinary drugs, Ca intake, and housing. AJDW

150

[Characteristics of *Bacillus cereus* strains isolated from various foods.]

Major, P.; Rimanoczy, I.; Ormay, L.; Belteky, A.

Elelmezési Ipar 33 (8) 314–315 (1979) [Hu, en, de, ru] [Országos Elelmezési & Táplakozástudományi Intézet, Gyáli út 3/a, 1476 Budapest, Hungary]

A total of 54 strains of *B. cereus* was examined, 12 from food poisoning cases and 42 from various foods not causing food poisoning. No significant differences could be detected among the strains from food poisoning cases by the examination of the biochemical properties, antibiotic sensitivity, production of an enterotoxin like substance, cerecin production and phage sensitivity. It was found, however, that the strains isolated from various foods not implicated in food poisoning could be identified by phage typing. The same phage types were isolated from eggs, flours, and pasta. A relationship was also established between phage types and cerecin types (72.2% of the strains proved to be cerecin producers). In the case of pasta, it was possible to determine by phage typing whether the contamination occurred at the packaging stage or during manufacture. ESK

151

[Egg box.]

Ono

French Patent Application 2 418 753 (1979) [Fr]

Boxes of transparent plastics shaped to form 4 or 6 octagonal pockets for holding eggs have a flat cartonboard cover and fixed projections which permit safe stacking. W&Co

152

[Package for eggs.]

Grillet, P.

French Patent Application 2 418 754 (1979) [Fr]

Packages to hold 6 eggs each are made of heat moulded plastics and consist of a base shaped with serrated pockets to hold half of each egg and a cover

hinged to the base with a flat top round the edge of which is a serrated wall shaped to enclose the upper half of the eggs. W&Co

153

[Improvements to the packaging of eggs.]

Union des Cooperatives Agricoles Rhone-Alpes (UCARA)

French Patent Application 2 424 858 (1979) [Fr]

Eggs are packed in multiples of 5 or 6 in trays. Each tray has alternate humps and hollows. The eggs rest in the hollows and are enclosed by a flat cover which has projecting pieces which engage with the tops of the humps so as to support the weight of the cover. W&Co

154

[Relationships between ornithine transcarbamylase genotypes and some economical traits in White Leghorn breed chicken.]

Tsuji, S.; Fukushima, T.

Science Reports of Faculty of Agriculture, Kobe University 14 (1) 183-187 (1980) [10 ref. Ja, en]

Relationships between renal ornithine transcarbamylase (OTC) genotypes and some economic traits, including egg qualities, in White Leghorn chickens were investigated. 83 hens were classified into 3 groups by Oc^b genotype (Oc^b heterozygous, Oc^b homozygous and no Oc^b gene). Birds with Oc^b gene produced more and heavier eggs than those with no Oc^b gene. Haugh unit score of the hens having Oc^b gene was lower than those having no Oc^b gene. [From En summ.] VJG

155

[Plant for automatic individual breakage of eggs.]

Digeos, J.

French Patent Application 2 420 308 (1979) [Fr]

A machine is shown for voiding eggs in which the eggs, standing vertically in trays moving horizontally, are each brought into contact with a rotating knife which cuts a cap from the bottom while the top is pierced, and air under slight pressure is blown in. W & Co

156

Low glucosinolate rapeseed meals and egg taint.

Pearson, A. W.; Greenwood, N. M.; Butler, E. J.; Fenwick, G. R.

Veterinary Record 106 (26) 560 (1980) [8 ref. En] [Houghton Poultry Res. Sta., Huntingdon, Cambridgeshire, UK]

10 Rhode Island Red \times Light Sussex hens, aged 36 wk, were fed diets containing 100 g Tower cv. rapeseed meal (2.3 g progoitrin/kg)/kg feed, for 28 days. ^{14}C -TMA (trimethylamine) oxidation tests were carried out immediately, before rapeseed was introduced, after it had been fed for 14 and 28 days, and 28 days after it had been withdrawn. Eggs were collected for TMA analysis before the meal was fed and 10-14 days afterwards. ^{14}C -TMA oxidation tests show that after 14 days the ability of hens to oxidise TMA had been greatly reduced. Overall, the meal produced a

5-fold increase in TMA content of eggs

($0.50 \pm 0.14 \mu g/g$ vs. $<0.10 \pm 0.03 \mu g/g$). This experiment demonstrates that feeding a low glucosinolate rapeseed meal can depress TMA oxidation in sensitive hens to such an extent that their eggs are tainted with TMA and it is unlikely that the use of glucosinolate-free *Brassica napus* rapeseed meal would make an important contribution to prevention of egg taint. SP

157

The nutritional value of rapeseed meal for caged layers.

Hulan, H. W.; Proudfoot, F. G.

Canadian Journal of Animal Science 60 (1) 139-147 (1980) [14 ref. En, fr] [Res. Sta., Agric. Canada, Kentville, Nova Scotia B4N 1J5, Canada]

1536 Single Combed White Leghorn pullets of 2 commercial genotypes ((i) and (ii)) were fed soybean meal (SM), Tower or Candle rapeseed meal (RSM) during either the growing or laying period or both, at 10, 15 or 20% replacement level. Lighting was reduced gradually from 40 lux for the 1st 24 h to 0.5 lux from 22 to 140 days old; during laying lighting was maintained on a daily photoperiod of 14 h light of approx. 10 lux. The following egg traits were measured: egg wt., shell strength (sp. gr.) and interior quality (Haugh units), and results are tabulated. Egg wt. of genotype (ii) was significantly ($P < 0.01$) heavier than (i). At 224 and 308 days, eggs laid by birds fed a control diet during growing and laying were significantly heavier than those fed diets containing RSM; egg size was significantly smaller with RSM diets. Sp. gr. of eggs was higher for genotype (i) than (ii), and at 224 days hens fed 20% Candle RSM during growing and 10% Candle RSM during laying had significantly higher sp. gr. than hens fed the same diet but with 15% Candle RSM during the laying period. Haugh units were significantly higher in eggs laid by genotype (ii) than (i), and there were no significant effects of dietary regimen on Haugh units at 210 or 322 days. At 497 days Haugh units of birds fed control diets or 20% Candle RSM during growing + 10% Candle RSM during laying were significantly higher than those of eggs of other dietary regimens. SP

158

The effects of induced pauses on the performance of layers.

Shirley, H. V.; Tugwell, R. L.; McGhee, G. C.

Tennessee Farm and Home Science No. 112, 19-21 (1979) [5 ref. En] [Agric. Exp. Sta., Univ. of Tennessee, Knoxville 37901, USA]

The following treatments were used to induce pauses in Hy-Line layers: (i) untreated (control), (ii) feed and water restriction for 3 days, (iii) 15 000 p.p.m. Zn in form of ZnO_2 for 3 days, (iv) 7500 p.p.m. I in the form of ethylenediamine dihydro-iodide for 6 days, and (vi) I as in (v) except feeding for 12 days. Effects of pauses caused by (i)-(vi) on egg quality were evaluated on all eggs laid on day 15, 25, 34, 49, 77, 101 and 134 of the 140 day experiment and results (averages over the 134 days) were for (i)-(vi) resp.: egg wt. (g/egg) 64.3, 65.5, 64.8, 65.2, 65.4 and 64.1; egg sp. gr. score (shell

quality) 3.20, 3.51, 3.45, 3.47, 3.44 and 3.52; and interior egg quality (Haugh units) 73.3, 74.1, 72.6, 75.5, 73.2 and 74.3. From the results it was concluded that egg quality (Haugh units and sp. gr.) was significantly ($P < 0.05$) improved by all pause treatments. Zn treatments significantly decreased egg shell roughness. SP

159

Marketing of eggs.

Daspurakayastha, P. C.

Poultry Guide 17 (4) 43-44 (1980) [En] [Dep. of Anim. Husbandry & Vet. Sci., West Bengal, India]

The precautions to be taken in marketing of eggs, the procedures to be followed and the methods of marketing of eggs prevalent in India are covered. CFTRI

160

Feed for poultry.

Klein, S.

United States Patent 4 197 293 (1980) [En]

Feed supplements are described for chickens to effectively decrease the cholesterol content of eggs, and comprise vegetable materials containing naturally occurring I, niacin, hormones and minor amounts of Ca and Mg. IFT

161

Feed for poultry.

Klein, S.

United States Patent 4 197 294 (1980) [En]

See preceding abstr.

162

Nutritional value of rapeseed gums for chickens.

Clandinin, D. R.; Robblee, A. R.; Darlington, K.;

Ichikawa, S.

Poultry International 18 (11) 92, 94-97 (1979) [En, it, de, fr, es]

A total of 1200 pullets (equal numbers of Shaver Starcross 288 and Hyline W36 White Leghorns) were used in a study on effects of diets containing 10% rapeseed meal with 0, 2 or 6% added rapeseed gums on laying performance and egg quality. A table of results is given, including data for egg wt., Haugh unit scores, sp. gr., egg size grades, % rots and % cracks. No significant effect of dietary rapeseed gums on egg quality was observed. AJDW

163

Egg containing iodinated amino acids.

Nihon Nosan Kogyo Co. Ltd.

UK Patent Application 2 027 325A (1980) [En]

The I content of eggs is increased by feeding poultry a composition to which calcium iodate has been added (230 mg calcium iodate/kg of feed). IFT

164

Egg grading.

Loeffler, T. V. (Diamond International Corp.)

United States Patent 4 195 736 (1980) [En]

An egg grader is described having a number of weighing stations each capable of simultaneously weighing a number of eggs on a number of individual scales. IFT

165

Quality is factor in US egg sales.

Greenfield, R.

Poultry International 18 (8) 54, 56, 58 (1979) [En, fr, it, es, de]

Changes in the quality of eggs exported from the USA to the Arabian peninsula are discussed with reference to a table of data showing quality of eggs at the time of export and on arrival at Sharjah. Temp. of eggs during sea transport was 2-10°C. Data are also given for the quality of eggs exported to Sharjah from an East European country. The results show that quality grade deteriorated during transport to Sharjah. Quality was, however, superior to that of eggs from the East European supplier: American eggs were graded higher, had lower % dirty eggs and lower losses, but higher % checks. Packaging of American eggs tended to be better than that of eggs from other suppliers; marking of American eggs was inferior to that of eggs from other countries. The relatively small egg size of some batches of American eggs is criticized by importers and retailers in Sharjah. AJDW

166

[Studies on determination of optimum dietary level of phosphorus for poultry. III. Effects of level of phosphorus on performance of laying hens.]

Han, I. K.; Sohn, K. S.; Kim, J. I.; Kim, C. S.

Korean Journal of Animal Science 22 (2) 135-142 (1980) [28 ref. Ko, en] [Coll. of Agric., Seoul Nat. Univ., Suweon, Seoul, Korea]

200 twenty-one wk old White Leghorn laying hens were fed diets containing (i) 0.43, (ii) 0.53, (iii) 0.62, (iv) 0.72 or (v) 0.81% total P for 24 wk in order to determine optimum dietary level of P. Results, presented in tables, were for (i)-(v) resp.: average egg wt. 54.3, 54.8, 55.1, 55.3 and 54.7 g; % shellless eggs 1.20, 0.90, 0.85, 0.91 and 1.15; shell thickness 0.363, 0.363, 0.368, 0.361 and 0.365 mm; % total ash content of egg shell (DM basis), 99.02, 97.14, 97.36, 97.15 and 97.00; and % Ca content of egg shell (DM basis), 37.86, 37.88, 38.00, 37.91, and 38.04. It was concluded that (iii) in laying diets was adequate for the performance of laying hens. [From En summ.] SP

167

Cholesterol content of chicken egg as affected by feeding garlic (*Allium sativum*), sarpagandha (*Rowllia serpentina*) and nicotinic acid.

Sharma, R. K.; Singh, R. A.; Pal, R. N.; Aggarwal, C. K. *Haryana Agricultural University Journal of Research* 9 (3) 263-265 (1979) [6 ref. En] [Dep. of Livestock Production & Management, Haryana Agric. Univ., Hissar, India]

An attempt was made to lower the egg cholesterol level by feeding certain hypocholesterolemic compounds like nicotinic acid, garlic powder, and sarpagandha powder at various levels: All these

compounds, irrespective of level, reduced the cholesterol level significantly. Feeding of garlic powder and nicotinic acid decreased the cholesterol level without adversely affecting the egg production. However, in case of sarpagandha the decrease in cholesterol content of eggs also resulted in decrease in egg production and feed intake. AS

168

Mixing material in sealed containers.

Grise, F. G. J.; Lovell, W.

United States Patent 4 184 422 (1980) [En]

Mixing or homogenization of hens eggs is achieved by piercing the egg at its smaller end with a relatively small needle pointing upwards while holding the egg in the hand. The needle has an upper offset portion which acts as a beater, and the needle is rapidly rotated inside the egg. HBr

169

Standardization and quality control in poultry industry in India.

Santwani, M. T.

Poultry Guide 17 (2) 31-36 (1980) [En] [Indian Standards Inst., New Delhi, India]

Current Indian standards applicable to poultry and eggs are briefly discussed. They are: IS:6659-1972 (Code of practice for ante- and post-mortem inspection of poultry); IS:7049-1973 (Code for handling, processing quality evaluation and storage of poultry); IS:4674-1975 (Dressed chicken, chilled and frozen); IS:5558-1970 (Chicken essence); IS:4723-1978 (Egg powder); IS:6558-1972 (Code of practice for cold storage of shell-eggs); and IS:8539 (Part I)-1977 (Terminology of meat products and meat animals. I. Poultry). Further standards for poultry products are in preparation. CFTRI

170

Semi-chronic toxicity of β -hexachlorocyclohexane (β -HCH) and hexachlorobenzene (HCB) in laying hens.

Kan, C. A.; Strik, J. J. T. W. A.; Koeman, J. H.

Mededelingen van de Faculteit

Landbouwwetenschappen Rijksuniversiteit Gent 44 (2) 965-973 (1979) [33 ref. En] [Spederholt Inst. for Poultry Res., 7361 DA Beekbergen, Netherlands]

Laying hens were fed diets incorporating 1-625 mg β -HCH/kg or 125-625 mg HCB/kg for 12 wk. β -HCH had no effect on body wt., feed consumption, egg production, quality of egg shell, porphyrin excretion or various anatomical/histopathological parameters. The max. HCB concn. decreased body wt., had some minor anatomical effects and induced hepatic drug enzyme activity. HBr

171

Genetic and phenotypic parameters of the components parts of egg weight in Fayoumi and Rhode Island Reds.

Mostageer, A.; Obeidah, A.

Annales de Genetique et de Selection Animale 10 (2) 251-257 (1978) [11 ref. En, fr] [Anim. Breeding Dep., Fac. of Agric., Cairo Univ., Cairo, Egypt]

This paper includes data for the total wt., yolk wt., albumen wt. and shell wt. of eggs laid by Fayoumi and Rhode Island Red hens, together with genotypic and phenotypic variances, genotypic and phenotypic correlations and heritability estimates. AJDW

172

[Egg quality indices in the most widely distributed laying-hen hybrids.]

Petrovska, E.; Spacek, F.

Zivocisna Vyroba 24 (9) 651-658 (1979) [6 ref. Cs, ru, en, de] [Vysoka Skola Zemedelska, 662 65 Brno, Czechoslovakia]

Hybrid laying hens (Hisex, Shaver S 288 from Nitra, and Shaver S 288 from Premyslovice, (the most widely distributed hybrids in Czechoslovakia) were used in these tests. The hens were on deep litter, but in Premyslovice some were also in cages. During a 10-months lay, 30-egg samples were collected every 2nd month, and wt., shell strength, shell thickness yolk/white ratio, and the refractive index of the egg-white were measured. Mean 2-month values with variation coeff. are tabulated for each variant. Overall mean values for Hisex, Shaver Nitra, Shaver Premyslovice on deep litter and Shaver Premyslovice in cages were resp.: egg wt., 60.2, 59.8, 58.1 and 59.1 g; shell strength, 24.6, 23.9, 24.1 and 24.8 N; shell thickness, 0.35, 0.31, 0.34 and 0.34 mm. Egg white protein contents calculated from the refractive indices were 10.2, 10.8, 10.4 and 10.2%. Variations in yolk/white ratio are also discussed. SKK

173

The fluorine content of eggs from hens fed diets supplemented with Christmas Island phosphate.

Karunajeewa, H.; Minchinton, I.

Food Technology in Australia 31 (8) 320-321 (1979) [8 ref. En] [Dep. of Agric., Anim. Res. Inst., Werribee, Victoria 3030, Australia]

White Leghorn \times Australorp hens housed in individual cages were fed a laying diet supplemented with either 3.1% sterilized bone meal (low F diet - 26 mg F/kg) or 2.5% Christmas Island phosphate (high F diet - 390 mg F/kg). After 12 months on this diet, 36 eggs selected at random from each of the 2 groups of hens were used for detn. of F. The eggs were broken out, the yolk and albumen were mixed, freeze-dried and stored for analysis. In a second experiment, the yolk and albumen from the eggs of hens fed a diet with 2.5% Christmas Island phosphate were freeze-dried either before or after boiling for 20 min. Yolk and albumen and shells of the eggs were analysed for F. Results are tabulated. Hens consuming as much as 46 mg F daily deposit not more than 0.20 to 0.23 mg F/kg in the edible components of the egg. The boiling of such eggs, for 20 min, caused an increase in the F content of the edible components to about 0.60 mg/kg. The shells of these eggs contained about 64 to 90 mg F/kg. The feeding of a diet containing 2.5% Christmas Island phosphate to hens resulted in an 18 fold increase in the F content of egg shells compared to that in the egg shells of hens fed a diet with sterilized bone meal (5 mg/kg). VJG

174

Effects of density in cages on egg production, feed for dozen eggs and egg quality studies.

Ravindra Reddy, V.; Varadarajulu, P.; Subba Rao, K. V.; Appa Rao, V.; Chandra Reddy, V. R.
Indian Veterinary Journal 56 (1) 49-52 (1979) [8 ref. En] [Dep. of Poultry Sci., Coll. of Vet. Sci., Tirupati, AP, India]

160 Single Comb White Leghorn laying hens (22 wk of age at the start of the trial) were used in a study on effects of floor space/bird in the laying cage (1800, 900, 600 or 450 cm², i.e. 1, 2, 3 or 4 birds/cage) on laying performance and egg quality. Tables of data are given, including values for egg wt., Haugh unit score, shell thickness and incidence of blood spots. Higher incidence of blood spots was observed at low than at high space allowance/bird; no significant effect of space allowance on egg wt., Haugh unit score or shell thickness was observed. AJDW

175

[Report of the test station for laying hens 1978-80.]

Neergaard, J. V.

Beretning fra Statens Husdyrbrugsforsog No. 495, 30pp. (1980) [3 ref. Da, en]

Results of studies during the period 1978-1980 at the Favrholt test station for laying hens are reported and discussed. 28 groups of laying hens and 14 groups of broiler parent stock were studied, including commercial lines, and White Leghorn and White Plymouth Rock hens. Tables of data are given for mortality, growth, feed utilization, egg yield, plumage condition, egg wt., % broken eggs, % shell-less eggs, and correlations between egg sp. gr. and the % broken eggs. The reliability of use of sp. gr. measurement for estimation of shell strength is discussed; it is concluded that sp. gr. may be used for evaluation of shell strength, but that data for the % cracked eggs (which are not suitable for sp. gr. detn.) should be taken into account. AJDW

176

Application of anticoagulants during pasteurization of egg white and liquid whole eggs.

Niewiarowicz, A.; Trojan, M.; Kijowski, J.; Kujawska-Biernat, B.

Archiv für Geflügelkunde 44 (1) 17-21 (1980) [17 ref. En, de, fr, ru] [Inst. for Anim. Products Tech. Acad. of Agric., Poznan, Poland]

Studies were conducted on effects of anticoagulants (triethyl citrate at 0.01 or 0.02%, polyphosphate at 0.50 or 0.75%) on the coagulated protein %, viscosity and pH of egg white pasteurized at 58° or 61°C or whole egg pasteurized at 65° or 68°C, and the whipping ability, foam stability and baking properties (cake height) of egg white pasteurized at 57° or 58°C. Tables of results are given and discussed in detail. The % coagulated protein increased with increasing pasteurization temp. Polyphosphate was more effective than triethyl citrate in prevention of coagulation of protein in egg white at 58° and 61°C, and in whole egg at 65°C; however, in whole egg pasteurized at 68°C, triethyl citrate was more effective than polyphosphate. Viscosity was of little value for evaluation of effectiveness of anticoagulants in egg white, but may be of value for evaluation of

anticoagulants in whole egg, and also for detection of pasteurization of this product. Triethyl citrate improved the whipping performance, foam stability and cake height of egg white; polyphosphate improved whipping performance of egg white pasteurized at 57°C but not that pasteurized at 58°C, had little effect on foam stability, and impaired cake height. AJDW

177

[Automation and mechanization - poultry, eggs and other problems. Collection of research results, 1963-1975.] Automatizacia a mechanizacia - hydina, vajcia, ostatna problematika. [Book]

Czechoslovakia, Vyskumny Ustav Hydinarskeho Prumyslu

118pp. (1978) [Sk] Bratislava, Czechoslovakia; VUHP

The collection comprises results of studies completed at the machinery and development department of the Research Institute of the Poultry Industry in Bratislava. Chapters are: Automation of poultry processing, and mechanization of technological operations (pp. 5-54); Materials handling and other problems (pp. 55-88); Mechanization of technological operations during the handling and processing of eggs (pp. 89-99); and Problems of the processing of other poultry products (pp. 100-117). STI

EGG PRODUCTS

1

[Rapid method for fat extract determination in pasta.]

Sulkowska, J.; Charlampowicz, L.; Jelska, T. *Przemysł Spożywczy* 32 (7) 263-265 (1978) [10 ref. Pl, ru, en, fr, de] [Cent. Lab., Przemysłu Koncentratów Spożywczych, Poznań, Poland]

4 different shapes of each of 1-egg, 2-egg, 4-egg and egg-less pasta types manufactured on Braibanti and Bühler lines from hard wheat and Amber var. durum wheat flours and dried egg and containing 10-12% moisture were used in the tests. Fat extract was determined (i) refractometrically, 10 g ground pasta being extracted with 10 ml 1-bromonaphthalene and quantity of extract being calculated from difference in refractive index between solvent and filtered extract multiplied by a factor established empirically for each type of pasta, or (ii) gravimetrically by diethyl ether extraction for 42 h according to Polish Standard PN-68/A-74130. Results of a total of 282 detn. by (i) and 128 detn. by (ii) are tabulated in detail. No significant differences were found between results by (i) and (ii); overall mean fat extract contents of the different egg content types of pasta were, in the order listed above, 1.45, 1.97, 2.88 and 0.89%. Method (i) is recommended for inclusion in the stated Polish standard as simple, rapid and accurate. SKK

2

Egg product preservation.

Liot SA

British Patent 1 543 512 (1979) [En]

Liquid egg products are preserved by the addition of salt and/or sugar together with the removal of dissolved O₂, followed by storage at reduced pressure in the presence of an inert gas. IFT

3

Lipid stability of cooked, diced, and frozen eggs.

Hoojjat, P.; Dawson, L. E.

Poultry Science 58 (1) 156-161 (1979) [11 ref. En] [Food Sci. & Human Nutr. Dep., Michigan State Univ., E. Lansing, Michigan 48824, USA]

Lipid oxidation in commercially prepared cooked diced frozen egg samples was evaluated. Eggs were cooked, peeled, diced, and quick frozen (CO₂) under commercial conditions. Before freezing one-half of the product was treated with a commercial antioxidant, Tenox 2%. Control and treated eggs were packaged in air and under partial vacuum and stored at -23° and -12°C for 6 months. Other samples were held at 4°C for 15 days. Fat and moisture content, lipid oxidation (TBA), total bacteria plate counts, and sensory scores were obtained from appropriate samples during storage. TBA values were relatively low in all samples throughout storage, indicating that autoxidation was not a problem. Flavour scores of samples held at -12°C differed more from a reference than those held at -23°C indicating lower acceptability. Bacterial counts (after 6 months storage) were lower for those eggs held at -23° than at -12°C. Antioxidant and packaging treatments had only minor effects on egg quality, presumably due to the low level of changes found in TBA, sensory scores, and microbial counts. AS

4

Sanitary processing of egg products.

Bergquist, D. H.

Journal of Food Protection 42 (7) 591-595 (1979) [3 ref. En] [Henningsen Foods, Inc. 14334 Industrial Road, Omaha, Nebraska 68144, USA]

The egg products industry has gone through dramatic changes in recent yr as influenced by regulations requiring pasteurization of egg products, mandatory USDA inspection, establishment of E-3-A Standards for equipment, and tight customer specifications. Quality control for egg products includes: procurement of good raw materials; use of adequate pasteurization, processing and sanitary procedures; microbiological testing, including for Salmonella; and safeguards against recontamination. Pasteurization methods have been developed which substantially reduce the hazard of potential pathogens and still retain the heat-sensitive properties of the raw egg. Present egg products have very good functional and microbiological quality. AS

5

Rheological properties of commercial egg products.

Pitsilis, J. G.

Dissertation Abstracts International, B 39 (10) 4981: Order no. 79-06911, 179 pp. (1979) [En] [Univ. of Missouri, Columbia, Missouri 65201, USA]

The flow behaviour of 4 basic forms of commercial egg products were studied within a temp. range of 5-45°C and a shear rate range of 37-350 s⁻¹. Two products, namely the raw products Egg White and Egg Yolk, were found to be time-dependent liquids (the shear stress experienced at constant shear rate and temp. decreases with time). For the 2 other egg products, Salted Whole Egg and Salt Yolk, no time-dependency was detected. Furthermore, all 4 products were found to be shear-thinning or pseudoplastic materials. The Egg White was found to be the most non-Newtonian, while the Salted Whole Egg deviated slightly from Newtonian behaviour. The power-law model $\tau = k\dot{\gamma}^n$ was fitted to the data collected for all 4 products. The prediction equations derived describe the data with coeff. of detn. > 0.98. These equations consist of functional expressions for the power-law constants k and n in terms of solid content and/or temp. Energy requirements for friction losses for egg product flow in round pipes can be calculated on the basis of data predicted by the equations. AS

6

[Method of sterilizing egg products.]

Stepanov, V. A.; Kuligina, A. I.; Bulychev, O. A.; Kozlova, A. L.; Nisueva, G. V. (Union of Soviet Socialist Republics, Nachno-proizvodstvennoe Ob'edinenie Ptitsepererabatyvayushchei i Kleezhelatinovoi Promyshlennosti "Kompleks") *USSR Patent* 644 445 (1979) [Ru]

To sterilize egg products contaminated with pathogenic microorganisms while retaining their organoleptic and physicochemical properties, the products are made alkaline (to pH 7.9-8.5) and H₂O₂ is added at the rate of 0.5-0.6% of product wt. W&Co

7

Health laws and regulations – Federal Republic of Germany.

World Health Organization

International Digest of Health Legislation 29 (4) 727–739 (1978) [En] [Geneva, Switzerland]

A selection of Federal Republic of Germany health laws and regulations is presented including the following which relate to food hygiene: Ordinance of 3 Aug. 1977 on substances having a pharmacological action; Ordinance of 25 Nov. 1977 on fruit juices, conc. fruit juices, and dried fruit juices; Ordinance of 6 Dec. 1977 amending the Ordinance on exemptions from the withdrawal period required under the second sentence of subsection 2 of Section 15 of the Foodstuffs and Consumer Goods Law; Ordinance of 9 Dec. 1977 concerning details of the nutritive value of foodstuffs; Ordinance of 9 Dec. 1977 amending the Ordinance on vitaminized foodstuffs; Ordinance of 20 Dec. 1977 on the marketing of additives and individual foodstuffs used as additives; Ordinance of 20 Dec. 1977 amending the Cheese Ordinance and the Ordinance on milk products of 15 July 1970. Annex 1 to this Ordinance, lists permitted additives for cheese and cheese products, while Annex 3 introduces a new Annex 2 to the Ordinance on milk products, including permitted additives; Fifth Ordinance of 20 Dec. 1977 amending the Diets Ordinance; Ordinance of 20 Dec. 1977 amending food law ordinances; and Ordinance of 20 Dec. 1977 amending the Meat Ordinance and the Egg Products Ordinance. VJG

8

E-3-A sanitary standards for pressure and level sensing devices.

International Association of Milk, Food & Environmental Sanitarians; United States of America, Department of Agriculture; United States of America, Poultry & Egg Institute of America; United States of America, Dairy & Food Industries Supply Association
Journal of Food Protection 42 (7) 606–608 (1979) [En]

Criteria for design, materials and fabrication of elements used to sense pressure and/or product level in liquid egg products equipment are given. DIH

9

[Limits of permissible bacterial load in specified foods and beverages.]

Italy, Ministro della Sanita

Industria Conserve 54 (1) 62–76 (1979) [It]

The Ministerial Ordinance of 11 Oct. 1978 (Supplement to the Official Gazette No. 346, 13.12.1978) on limits of microbial load in milk, egg products, ice cream and ice cream ingredients is reproduced, including tabulated limits and methods of sampling and estimation. RM

10

[Ministerial Ordinance of 11 October 1978.

Microbiological tolerance limits for certain foods and beverages.]

Anon.

Industria del Latte 15 (1) 121–123 (1979) [It]

This Ordinance, published in *Gazzetta Ufficiale della Repubblica Italiana* No. 346 of 13 Dec. 1978, specifies the microbiological tests to be performed on sterilized milk, UHT milk, pasteurized milk, dried milk for infant feeding, egg products, ice creams, and preparations for ice cream. In each case the number of samples to be tested is indicated, together with the microbiological requirements which must be satisfied. ADL

11

[Rheodynamic computation of bulk egg flow in YaP-400 drier channels.]

Aret, V. A.; Belousov, A. K.; Koryachkin, V. P.; Rodionov, A. Kh.; Sivushkov, B. P.

Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 1, 98–99 (1979) [7 ref. Ru] [Kemerovskii Tekh. Inst. Pishchevoi Promyshlennosti, Kemerovo, USSR]

The effects of the hen breed, hen feed regime and geographical origin on the flow characteristics of egg melange were studied; flow characteristics are described in terms of the Herschel-Balkley equation. The rheological constants of this equation were found to be within the limits ultimate shear stress 0.625 ± 0.105 Pa, consistency coeff. 0.101 ± 0.04 Pa s, and flow index 0.879 ± 0.061 . Rheological calculations may be made by means of the Hedström nomogram. STI

12

Oil based egg pickles. (In 'Fats and oils in relation to food products and their preparations' [see FSTA (1980) 12 2N67].) [Lecture]

Vaidehi Swamy; Gowda, A. R.; Krishnamurthy, S. pp. 56–59 (1978) [9 ref. En] [Univ. of Agric. Sci., Hebbal, Bangalore, India]

4 types of gravy (green chillies + oil, vegetarian masala + oil, garam masala + oil and water + condiments) with lemon and salt were used in the preparation of egg pickles; egg pickles produced were compared for physico-chemical characteristics, microbiological keeping quality, and acceptability. Results are tabulated. Oil based pickles were found to be more acceptable than water based pickles, which developed off-odours, heavy fungal growth and were unacceptable for consumption within 10 days. A layer of 1 cm oil at the top of storage jars was critical for preservation of egg pickles. Preparation of egg pickles, at home and on a commercial scale, increased the market value of small eggs, rendered cooked eggs tasty, extended their shelf life, and improved the nutritional value of pickles. SP

13

Pasteurization of salted whole egg inoculated with Arizona or Salmonella.

Ng, H.; Garibaldi, J. A.; Ijichi, K.; Mihara, K. L. *Applied and Environmental Microbiology* 37 (6) 1091–1095 (1979) [15 ref. En] [W. Reg. Cent., Sci. & Education Administration, USDA, Berkeley, California 94710, USA]

Recently, *Arizona* bacteria, close relatives of *Salmonella*, were recovered from salted whole egg that

had been pasteurized by the presently recommended process of 63.3°C for 3.5 min. Because of this and the fact that the heat resistance of *Arizona* in salted whole egg had not been determined, the present study was undertaken. *Arizona* or *Salmonella*, grown in Trypticase soy broth supplemented with 2% yeast extract in Fernbach flasks covered with Al foil over cotton and gauze at 35°C with shaking at 176 rev/min for about 96 h, were found to have the greatest degree of heat resistance. As expected, these cells, when inoculated into salted whole egg at 10^7 cells/ml, survived heating at 63.3°C for 3.5 min in a 2-phase slug flow heat exchanger. To consistently achieve a 7-log kill of typical *Salmonella* or *Arizona*, a treatment of 67°C for 3.5 min was required. However, if a 7-log kill is mandatory, it remains to be determined whether this process affects the functional properties of this product. AS

14

[Maximum microbial counts laid down by the Ministry of Health.]

Italy, Ministero della Sanita

Pasticceria Internazionale 2 (6) 37-43 (1979) [It]

The entire text is given of an Ordinance of the Italian Ministry of Health dated 15 Oct. 1978 and published in *Gazzetta Ufficiale della Repubblica Italiana* No. 346 of 13 Dec. 1978. The Ordinance lays down microbiological requirements (total colony count, coliforms, salmonellae, etc.) for sterilized milk, UHT milk, pasteurized milk, dried milk for infant feeding, egg products, ice creams, and preparations (liquid mixes) for ice cream. Further information published in *Gazzetta Ufficiale* on 18 Dec. 1978, concerning the interpretation of the Ordinance, is also given, together with comments by S. Salza, chairman of the Italian Association of Patisseries and Ice Cream Producers (Sindacato Italiano Produttori Pasticceria e Gelateria Artigianale). ADL

15

The effect of water activity on growth of clostridia. Jakobsen, M.; Trolle, G.

Nordisk Veterinaarmedicin 31 (5) 206-213 (1979)

[19 ref. En, da] [Inst. of Hygiene & Microbiol., Royal Vet. & Agric. Univ., Copenhagen, Denmark]

Studies were conducted to evaluate the min. a_w value for growth of 55 strains of clostridia (representing 18 spp. of the genus *Clostridium*) isolated from foods (spices, dried soy protein, dried egg) and from bacteriological samples from canneries and slaughterhouses. The isolates were cultured in modified Robertson Cooked Meat Medium, adjusted to a_w 0.930, 0.945 or 0.965 with NaCl, glucose or glycerol. Vegetative cell cultures were incubated for 30 days at 30°C; growth was evaluated on the basis of gas formation. Tables of results are given. None of the strains studied could grow in media adjusted to a_w 0.930 with glucose or NaCl. Only 3 spp. (*Cl. bifermentans*, *Cl. subterminale* and *Cl. perfringens*) could grow in medium adjusted to a_w 0.945 with glucose; these 3 plus *Cl. sporogenes* could grow in medium adjusted to a_w 0.945 with NaCl. 3 spp. (*Cl. fallax*, *Cl. limosum* and *Cl. sphenoides*) did not grow in media adjusted to a_w 0.965 with glucose or NaCl. At equal a_w , more spp. grew in

the medium of which the a_w was adjusted with glycerol (all spp. growing at the 2 higher a_w values, only 5 failing to grow at the lowest a_w value). The inhibitory effects of a_w on initiation of outgrowth from *Clostridium* spp. spores were similar to effects on growth of vegetative cells. Practical implications of these results are briefly considered. AJDW

16

[Reduction of radiation-induced vitamin E and B₁ losses by irradiation of foodstuffs at low temperatures and by exclusion of atmospheric oxygen.] Verminderung von strahleninduzierten

Vitamin-E- und -B₁-Verlusten durch Bestrahlung von Lebensmitteln bei tiefen Temperaturen und durch Ausschluss von Luftsauerstoff.

Diehl, J.-F.

Zeitschrift für Lebensmittel-Untersuchung und -Forschung 169 (4) 276-280 (1979) [23 ref. De, en]

[Bundesforschungsanstalt für Ernährung, Engesserstrasse 20, D-7500 Karlsruhe 1, Federal Republic of Germany]

The protective effect of low temp. during irradiation on vitamin B₁ and E levels in foods is not abolished by subsequent storage or heating. Egg powder irradiated at 1 Mrad in the presence of air and stored for 4 months at ambient temp. lost 68% of its thiamin content when irradiated at 20°C, vs. 33% when irradiated at -30°C. Sunflower oil irradiated at 3 Mrad in the presence of air and subsequently heated for 1 h at 180°C lost 98% of its α -tocopherol content when irradiated at 20°C, 65% when irradiated at -30°C. Exclusion of atmospheric O₂ by packaging (prior to irradiation) under N₂ reduced the loss of α -tocopherol in irradiated (0.1 Mrad) rolled oats after 8 months of storage from 56 to 5% and the loss of thiamin from 86 to 26%. Vacuum packaging was equally effective during the 1st 3 months and somewhat less effective during the following 5 months. Packaging under CO₂ showed no advantage over packaging in air. Sensory evaluation of rolled oats, raw or cooked, 1 and 3 months after irradiation with 0.1 Mrad indicated no significant quality difference between unirradiated and irradiated samples packaged under N₂. AS

17

Residence time distribution of flow in a continuous sterilization process. [Review]

Lin, S. H.

Process Biochemistry 14 (7) 23-24, 26-27 (1979)

[27 ref. En] [Polytechnic Inst. of New York, Brooklyn, New York 11201, USA]

In design of continuous sterilization equipment for liquid food processing, knowledge of flow characteristics, especially residence time distribution, is of prime importance. Residence time distribution theory is introduced and literature on measurement of residence time distribution in commercial continuous sterilizers used for milk and egg products, and which often have complicated flow patterns resisting theoretical analysis and modelling, is reviewed. An equation is developed for prediction of the residence time distribution function for laminar flow of non-Newtonian liquids in a tubular sterilizer. DIH

18

Souffle mixes.

Brule, R.

UK Patent Application 2 012 548A (1979) [En]

A mixture, that can be frozen and then cooked to make sweet souffle, comprises preferably about 1.5 l pastry cream (prepared from milk, egg yolks, sugar and flour), 1 l choux paste (butter plus other ingredients) and about 1.5 l stiffly beaten egg whites. The mixture is preferably frozen in 30-40 ml portions, and can be kept frozen for > 5 months. FL

19

Formulation and evaluation of a low pH egg salad.

Simmons, S. E.; Page de Bartolucci, D.; Stadelman, W. J. *Journal of Food Science* 44 (5) 1501-1504, 1509 (1979) [26 ref. En] [Dep. of Anim. Sci., Purdue Univ., West Lafayette, Indiana 47907, USA]

A low-pH egg salad was formulated as an attempt to control microbial growth and to minimize public health hazards associated with egg salads. 3 formulations of salad were developed with different levels of acidity, ranging from pH 4.25 to 4.30. Commercially prepared hard-cooked eggs and acidic salad dressings were used in the formulation as well as an experimentally prepared soy-based salad dressing. Consumer acceptance was evaluated using an experienced 6-member sensory panel. The low-pH egg salads were given favourable ratings by the sensory panel, using a hedonic rating scale and triangular testing. After sensory evaluation, the preferred formulation was inoculated with *Salmonella seftenberg* to determine whether or not bacterial inhibition was exerted by the low-pH egg salad. A commercial sample of egg salad also was inoculated and bacterial growth in the 2 salads was studied for 60 h, at storage temp. of 5°C and 22°C. Samples taken from all acidic egg salad samples at 12 h intervals showed dramatic decreases in *Salmonella* numbers, especially during storage at room temp. (22°C). Shelf life of the product was determined to be > 5 wk under refrigeration at 5°C. IFT

20

Influence of cholesterol from various sources on experimental atherosclerosis in rabbits.

Kritchevsky, D.; Tepper, S. A.; Klurfeld, D. M.; Story, J. A.

Nutrition Reports International 20 (5) 663-667 (1979) [13 ref. En] [Wistar Inst. of Anatomy & Biol., 36th Street at Spruce, Philadelphia, Pennsylvania 19104, USA]

Rabbits were fed a semipurified diet augmented with 0.1% cholesterol fed in the form of crystalline cholesterol, egg yolk or dried egg powder. The levels of atherosclerosis resulting from the diets were similar, being highest in the group fed egg yolk and lowest in that fed crystalline cholesterol. Animals fed dried egg exhibited the highest serum total cholesterol levels and the lowest ratio of serum α/β lipoprotein cholesterol. AS

21

[Outlook for building plants for freeze-drying products of animal origin.]

Bogdanov, V. S.; Gorshkov, I. K.; Turyanskii, E. G. *Myasnaya Industriya SSSR* No. 9, 38-39 (1979) [Ru] [NPO "Kompleks", USSR]

In freeze drying the reported loss of nutritional value is 18% vs. 74% induced by thermal drying. Freeze-dried products wrapped in 3-ply polyethylene film in N atmosphere can be shipped and stored in uncontrolled environments which fluctuate during the yr; the holding times for canned products are 2-5 yr. Freeze-drying is promising for preservation of endocrinal/enzymic and special raw materials. As proved experimentally, the freeze-dried raw material gives higher yield vs. that of conventionally frozen; e.g. for pituitary glands the difference is 25-30%. Technologies for freeze-drying beef and pork, egg products and others are given. Some units (e.g. OPSU-OLM to make beef pepsin) and other projects are mentioned. STI

22

[New infant feeding products from eggs and poultry meat.]

Gonotskii, V. A.; Korotaeva, M. M.; Krainyaya, V. S.; Kholodov, V. V.; Popik, G. F. *Myasnaya Industriya SSSR* No. 9, 22-24 (1979) [Ru] [NPO "Kompleks", USSR]

Process technology for making 3 types of canned baby food (up to 1 yr of age) is described in detail; the types differ in the degree of dispersion of meat fibre. The product is made in a continuous mechanized line. For babies over 10 months of age sheet TU 49 505-78 specifying canned chicken soup (purce), is given. The finished product contains (in %): fat, 5.95; proteins, 6.7; dry residue, 20.6. To extend the range of products for school age children technologies and formulae for 5 types of egg sausages are given. There is also potential utilization of by-products such as stomachs, hearts for child feeding. Data on making these foods, progress in manufacture and consumption, and possible extension of production are discussed. STI

23

[Some problems of egg product manufacture.]

Fomin, M. V.; Krugalev, S. S.; Petrova, T. I.; Filimonov, A. F.; Lifshits, B. I. *Myasnaya Industriya SSSR* No. 9, 27-29 (1979) [Ru] [NPO "Kompleks", USSR]

Problems of mechanized manufacture of egg melange using a line with 2.4 t/shift capacity, and of dried egg powder (2.6 t/shift capacity) are discussed. The desired methods of raw material delivery, storage and processing stations are indicated. The dried egg powder is made from egg mass condensed to 42% DM in ultrafiltration equipment. The ultra-filtration reduces energy consumption 1.5x and doubles output. The conc. egg mass is dried in AI-ORCh equipment evaporating 500 kg water/h. The processes will be controlled and monitored automatically. For the 1st time, tests are being made of in-place circulation type sanitation of the equipment, relying on a system derived from the V2-OTsU unit. Mechanization of egg quality

inspection is being achieved. An electron-optical device was constructed and tested to detect and discard low-quality eggs or eggs with cracked shells. Improvements are needed for freezing the melange in blocks; freezing of melange in granules was also tested. The method appears to be promising. STI

24

[Bacterial contamination of liquid whole egg products.]

Suzuki, A.; Konuma, H.; Imai, C.; Mizutani, H.; Sashihara, N.

Journal of the Food Hygienic Society of Japan [Shokuhin Eiseigaku Zasshi] 20 (4) 247-256 (1979) [13 ref. Ja, en] [Nat. Inst. Hygienic Sci., Kamiyoga 1-chome, Setagaya-ku, Tokyo, Japan]

Experiments and surveys were performed in order to identify the source of bacterial contamination in unpasteurized liquid whole egg products. Of 1120 egg samples chilled at 2-3°C for 1.5 months, 61 showed bacterial contamination at counts $> 10^2$ /g; only 4 showed bacterial counts of $> 10^6$ /g (mainly Gram-negative bacteria). Washing of intact eggs before storage increased the frequency of bacterial contamination in the egg contents. A liquid whole egg sample inoculated with bacterial flora present on the egg shell showed only a relatively small increase in bacterial count within 1 h at 19°C. Quality control in the industrial manufacture of liquid whole egg products is discussed. TM

25

[Production of egg paste and dried eggs.]

Marin, G.

Revista de Cresterea Animalelor 29 (4) 41-44 (1979) [Ro]

Processing of eggs to paste or powdered products is briefly discussed, with reference to: use of eggs unsuitable for marketing in the fresh state; flow diagrams of processes for manufacture of egg pastes and powders; cleaning, breaking and separation of the eggs; fermentation, to remove sugars; ultrafiltration of the albumen before drying; homogenization; pasteurization (with reference to a table of data for required pasteurization conditions for various whole egg, albumen and egg yolk products); and spray and freeze-drying of egg products. AJDW

26

Cooking device.

Terzian, R. T. (Marvin Glass & Associates)

United States Patent 4 176 593 (1979) [En]

Device for cooking food, such as an omelette, incorporates a heat conductive grid or surface with ≥ 1 element. 2 cooking pans are positioned on the grid; they are connected by a hinge arrangement which permits omelette batter to be partially cooked in each of the pans by a simple flipping action. HBR

27

[Liquid egg products. Bulk egg, egg white and egg yolk, pasteurized.]

Bulgaria, D'rzhaven Komitet za Standartizatsiya

Bulgarian Standard BDS 6106-78, 5pp. (1978) [Bg]

This standard, which supersedes BDS 6106-73, applies to 3 grades of (i) bulk egg, (ii) egg white and (iii) egg yolk which may be chilled or frozen. Internal temp. of the frozen products shall be above -8°C , and $0-4^\circ\text{C}$ for chilled. Moisture contents shall be $\leq 75-78$, $\leq 88-90$ and $\leq 53-57\%$ for (i), (ii) and (iii), resp.; corresponding fat contents are 9-10, trace, and 23-27%; and pH 7-8 to 8-9, 8.5 to 9.5 and 5.8-6.8 to 6.8-7.8. No preservatives may be added. Saprophytic organisms counts shall be $\leq 100\,000-400\,000$ and for coliform titres 0.1-0.001 for all 3 products. There is no tolerance for pathogens. The products shall be packaged in cans or plastics (e.g. polyethylene) pouches. Storage is at 85-90% RH for frozen and chilled products; storage temp. (permitted storage period in parentheses) are -12° (6 months), -18° (8 months) and $0-4^\circ\text{C}$ (12 h). HBR

28

Aseptic canning process keys shelf-stable custard line.

Ranieri, S.

Food Product Development 13 (11) 32, 39 (1979) [En]

A description is given of the manufacture of the aseptically packaged 'Thank you' brand of egg custard by Michigan Fruit Cannery. The product is made with fresh egg yolks and thickened with carrageenan, xanthan gum, and locust bean gum. Other ingredients are skim milk, water, partially hydrogenated soybean oil, mono- and diglycerides, disodium phosphate, salt, artificial flavouring and riboflavin and annatto colour. Key considerations in developing an acceptable egg custard include pretreating the egg yolks to avoid curdling and utilizing the steam infusion cooking system. The line is to be extended by the introduction of 4 new flavour var. VJG

29

[New food foam products from cheese whey.] [Lecture]

Paquet, D.; Thou, K. S.; Alais, C.

Cahiers de Nutrition et de Dietetique 14 (3) 199-201 (1979) [5 ref. Fr, en] [Service de Biochimie Appliquee, Univ. de Nancy I, CO 140 54037, France]

A whey concentrate, containing 5% protein, was acidified with HCl to pH 2-4, heated at 55°C for 8-10 min, rapidly cooled to 20°C and adjusted with NaOH to pH 7.0. Products resulting from such treatment of ultrafiltration retentate, partially delactosed whey or concentrated whey had good whipping properties and foam stabilities; the product formed from demineralized whey had a less stable foam. Addition of sucrose before whipping increased foam stability. Meringues, prepared by whipping the ultrafiltration retentate foam product with 50% sucrose, were similar to those prepared from egg whites. Because of its salty taste, dried whey must be dialysed before using in meringues. [See also FSTA (1978) 10 10P1700.] [See FSTA (1980) 12 8P1456.] MEG

30

Prohibition of all new and replacement equipment and machinery containing liquid polychlorinated biphenyls (PCB's).

United States of America, Food Safety & Quality Service

Federal Register 45 (42, Feb. 29) 13471-13473 (1980) [En] [Washington, DC, USA]

PCB's are highly toxic and persistent in nature. A number of incidents of human food contamination from PCB's have occurred as a result of leakage from industrial equipment. It is therefore proposed to prohibit entry of new or replacement equipment or machinery containing PCB's onto the premises of plants producing meat, poultry and egg products under official inspection. CAS

31

[Frozen egg product.]

QP Corp.

Japanese Examined Patent 5 500 024 (1980) [Ja]

Boiled eggs from which the shells have been removed are dipped in an aqueous solution of dextrin and frozen. IFT

32

[Seasoned boiled egg.]

Kishida, N.; Naito, M.

Japanese Examined Patent 5 500 034 (1980) [Ja]

Raw eggs are treated with alkali, then acid, to remove the cuticle from the shell and to enlarge the pores, after which they are heated to 80°C in a vacuum to partially coagulate the egg white. The eggs are then dipped in a seasoning solution and boiled. IFT

33

[Vinegared egg product.]

Iwata Kagaku Kogyo

Japanese Examined Patent 5 500 033 (1980) [Ja]

A process is described in which raw eggs are treated with an aqueous acid for 3-4 days to dissolve the egg shells, after which the membranes are removed and the residue mixed to yield a product free from bitterness. IFT

34

[Combined effect of radiation dose, radiation temperature and water activity on the survival rate of 3 *Salmonella* serotypes.] Kombiniertes Effekt von Strahlendosis, Bestrahlungstemperatur und Wasseraktivität auf die Überlebensrate von drei *Salmonella*-Serotypen.

Moussa, A. E.; Diehl, J.-F.

Archiv für Lebensmittelhygiene 30 (5) 171-176 (1979) [17 ref. De, en] [Bundesforschungsanstalt für Ernährung, Engesserstrasse 20, 7500 Karlsruhe 1, Federal Republic of Germany]

Aqueous suspensions of *S. senftenberg*, *S. thompson*, and *S. typhimurium* were irradiated at 50, 100, 200 and 500 krad, 0°, 25° and 50°C and water activity (a_w) 0.20-1.0. Results, shown graphically and in tables, revealed that *S. senftenberg* was less radiation-resistant than *S. thompson* and *S. typhimurium* (D_{10} at a_w 1.0 and 25°C: 15.5, 21.8 and 21.9 krad resp.). Heating at 50°C for 15 min caused only a small reduction in all counts but

considerably reduced radiation resistance (D_{10} at a a_w 1.0 and 50°C: 10.0, 10.4 and 10.5 krad resp.). Decreasing a_w values (adjusted by increasing concn. of sugars, glycerol or salts) caused a steep rise in D_{10} -values at a_w 0.8-1.0, a smaller rise at a_w 0.5-0.8, and very little change in radiation resistance at a_w < 0.5. When salmonellae were irradiated in egg powder, the increase in radiation sensitivity due to increasing a_w was again most pronounced at a_w > 0.5. Radiation resistance in egg powder was much higher than in aqueous media with little difference between the 3 serotypes: D_{10} at 25°C and a_w 0.33 were 167, 170 and 173, and at 45°C 132, 134 and 135 krad resp. AS

35

[Studies on the proteolytic properties of alkaline duck's egg white.]

Lin, C. W.; Lai, C. Y.

Journal of the Chinese Agricultural Chemical Society 16 (1/2) 24-32 (1978) [14 ref. Ch, en] [Lab. of Chem. & Tech. of Anim. Products, Dep. of Anim. Husbandry, National Taiwan Univ., Taipei, Taiwan]

In order to study the reason for liquefaction of Pidan albumen and obtain good products, the proteolytic properties of fresh duck's egg white were investigated and some safe additives which showed inhibitory effects on proteolytic activity were added to the pickling solution. Properties of protease in egg white were: optimum temp. for protease was about 40°C and activity almost ceased at < 25°C or > 55°C; optimum pH was about 10.0, and activity almost ceased at 11.5; protease activity was increased by Ca^{2+} , Mg^{2+} , Zn^{2+} and decreased by Al^{3+} , Cu^{2+} , EDTA, Pb^{2+} , or potassium sorbate; and liquefaction of alkaline gelatinized egg white was inhibited by adding Al^{3+} , Cu^{2+} , EDTA, Pb^{2+} or potassium sorbate. When Al^{3+} , Cu^{2+} or potassium sorbate was added to the pickle solution for making Pidan, the alkaline gelatinized product remained unliquefied during 2 months storage at 25°C. Product analysis showed that moisture content of the egg white decreased greatly during pickling, and further decreased slightly during storage; pH value increased steadily until it reached 11.5, and then remained unchanged; free tyrosine content and ripening ratio increased gradually, and then showed little change during storage; and amino N increased slightly during pickling, and increased greatly during storage. AS

36

In action at Bowyer, Amersham.

Anon.

Food Processing Industry 49 (579) 30, 37 (1980) [En]

Bowyer, of Amersham, UK have purchased 2 new Erofa breeding and frying lines to replace 3 traditional gas fryers. The new lines have a capacity to process 21 000 Scotch and Savoury eggs/h. A description is given of Scotch and Savoury egg production. This involves loading 1000 eggs into metal mesh baskets, placing into near boiling water for 25 min, automatically shelling eggs, covering eggs with spiced meat mix manually for Scotch eggs or automatically round scrambled egg mix for Savoury eggs; coating in batter, breading, and frying in the Erofa fryer. [See also preceding abstr.] VJG

37

[Process for packaging soft or hard eggs and products so obtained.]

Toda, S.

French Patent Application 2 425 808 (1979) [Fr]

Method of packaging hard or soft boiled shelled eggs involves cracking a raw egg and emptying it into an egg shaped package without breaking the yolk. The package is then sealed and steamed or heated in hot water. W&Co

38

[Refrigeration of bulk eggs using rotary ice generator.]

Kuznetsova, T. E.; Tsvetkov, A. I.

Kholodil'naya Tekhnika No. 2, 20-22 (1980) [8 ref. Ru] [NPO 'Kompleks', USSR]

The operation of a rotary ice generator was studied during liquid egg refrigeration; attention was paid to product quality and the effect of the temp. of the evaporator wall and of the thickness of the product layer. The quality of the liquid egg was evaluated on the basis of viscosity changes, soluble protein concn., and foam formation characteristics. The product refrigerated using the ice generator was of better quality than a control refrigerated in corrugated cardboard boxes in air; productivity was substantially increased. The optimal refrigeration temp. was -33°C , at a product layer thickness of 1.1 mm. STI

39

Long eggs are proving popular.

Ernst, M.

Poultry International 18 (13) 42, 44, 46, 50 (1979) [En, de, fr, it, es]

The Sanovo Engineering A/S process for manufacture of 'long eggs' (cylindrical hard-cooked egg rolls) is briefly described, with reference to the equipment used and the freedom of the product from additives. Production and use of 'long eggs' in the United States of America, United Kingdom, Japan, Scandinavia, Switzerland, Bulgaria, Czechoslovakia and Mexico are briefly discussed. AJDW

40

Gas-flush packaging line.

Anon.

Food Engineering International 4 (11) 39 (1979) [En]

A description is given of a gas-flush packaging line, for packaging O_2 sensitive products, e.g. dried milk, baby food, coffee, liquid egg and butter oil, recently introduced by Terlet, Zutphen, Netherlands. The fully automatic vacuumizing and gas-flush packaging line evacuates O_2 from the container, replacing it with an inert gas, e.g. N_2 , and can handle a variety of container sizes without lengthy changeover times. The line eliminates turbulence, has no dead space under the vacuum chamber for accumulation of powders and has special guiding channels. Control devices are provided for each step of the process. SP

41

[Composition of commercial frozen whole egg. Statistical evaluation of data for 282 samples from 11 countries.] Zusammensetzung von Gefriervollei des Handels. Statistische Auswertung von 282 Proben aus 11 Ländern.

Hadorn, H.

Deutsche Lebensmittel-Rundschau 76 (6) 192-197 (1980) [8 ref. De, en, fr] [Zentrallab. Coop Schweiz, Basel, Switzerland]

A total of 282 samples of commercial frozen whole egg from 11 countries (Poland, Romania, Czechoslovakia, Germany, Finland, Hungary, Belgium, the Netherlands, South Africa, Spain and Switzerland) were analysed for DM and lipids; % egg yolk, egg white and 'extraneous water' were calculated. Histograms and tables of data are given. The relation of experimental results to values specified in the Swiss Food Manual is discussed. Differences between products from different countries are considered. Samples from East European countries had relatively high DM and yolk contents. Samples from Belgium, Germany, Finland and South Africa showed relatively low DM and yolk concn. A large proportion of Spanish samples had very low DM and yolk concn. AJDW

1

Effect of a 28 hour light: dark cycle on egg shell quality of end-of-lay birds.

Leeson, S.; Summers, J. D.; Etches, R. J.

Poultry Science 58 (2) 285-287 (1979) [7 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada]

62-wk old Single Comb White Leghorn hens were subjected to either a 24 h (14 light:10 dark) or 28 h (14 light:14 dark) day. Results from 30 individually caged birds on each treatment showed that the ahemeral light cycle resulted in an immediate decrease in egg shell deformation and increase in egg size. Egg production was not affected. Improvement in egg size is discussed in relation to possible dietary modifications. It is concluded that egg shell quality of end-of-lay birds can be substantially improved by imposition of a 28 h light:dark cycle. AS

2

A comparison of beta backscatter gauges for measuring egg shells.

James, P. E.; Pressly, R. S.

Poultry Science 58 (2) 361-364 (1979) [7 ref. En] [USDA, Sci. & Education Administration, Beltsville, Maryland 20705, USA]

3 beta-backscatter gauges used to determine egg shell properties were compared. One gauge had a large 5.4 cm Geiger-Mueller detector. The 2nd gauge had a small diam. 2.9 cm Geiger-Mueller detector; whereas, the 3rd gauge had a small diam. 2.9 cm surface barrier detector. The most consistent measurements were obtained with the large diam. Geiger-Mueller detector gauge. While all gauges were affected by temp. changes, the Geiger-Mueller detectors were affected least. A temp. change of the electronics created a much greater change in counts than a similar temp. change of the detectors. The differences between good and poor egg shells were determined by measuring the backscatter with each gauge. Although the gauge with the large Geiger-Mueller detector showed a smaller difference between good and poor egg shells than the one with a surface barrier detector, its superior reliability and temp. stability make it the preferable gauge. AS

3

Relationship of specific gravity of chicken eggs to number of cracked eggs observed and percent shell.

Holder, D. P.; Bradford, M. V.

Poultry Science 58 (1) 250-251 (1979) [9 ref. En] [Dep. of Poultry Sci., Clemson Univ., Clemson, S. Carolina 29631, USA]

When eggs differing in sp. gr. were processed through an egg-sizing machine and candled for cracks, there was a significant decrease in the number of cracked eggs as sp. gr. increased. There was also a significant increase in % shell as sp. gr. increased. AS

4

Laboratory measurements of eggshell strength. II. The quasi-static compression, puncture, non-destructive deformation and specific gravity methods

applied to the same egg.

Voisey, P. W.; Hamilton, R. M. G.; Thompson, B. K.

Poultry Science 58 (2) 288-294 (1979) [9 ref. En] [Eng. & Statistical Res. Inst., Res. Branch, Agric. Canada, Ottawa, Ontario, K1A 0C6, Canada]

Sp. gr., non-destructive deformation, puncture force, and compression fracture force measurements were obtained from 860 eggs collected from 3 flocks of Single Comb White Leghorn hens. Compression fracture and puncture force measurements indicated that tensile and shear fracture resistances of the shell material were related on a within egg basis and that the correlation between fracture shear stress and shell thickness was low. Linear relationships were found between sp. gr. and both puncture force and fracture shear stress while there was an apparent curvilinear relationship between these force measurements and non-destructive deformation. Stepwise regression analyses indicated that non-destructive deformation accounted for the most variation in predicting compression fracture force (54%). It was found possible to measure puncture and compression fracture force, in that order, on the same egg. Deformation measurements obtained using horizontally applied forces closely matched those obtained with the forces applied to the egg vertically. [See FSTA (1979) 11 8Q108 for part I.] AS

5

Calcium absorption, calcium-binding protein and egg shell quality in laying hens fed hydroxylated vitamin D derivatives.

Cohen, A.; Bar, A.; Eisner, U.; Hurwitz, S.

Poultry Science 57 (6) 1646-1651 (1978) [27 ref. En] [Inst. of Anim. Sci., Agric. Res. Organization, Volcani Cent., Bet Dagan, Israel]

A study was conducted with laying hens to evaluate the effects of cholecalciferol (CC), 25-hydroxycholecalciferol (25-OH-CC) and 1 α -hydroxycholecalciferol (1 α -OH-CC) on Ca-absorption, intestinal and uterine Ca-binding protein (CaBP), and egg shell quality. Ca absorption was significantly higher in a 1 α -OH-CC-fed hens during periods of egg shell formation when compared with CC- or 25-OH-CC-fed hens. During periods of uterine inactivity there were no significant differences in Ca absorption between the groups. Intestinal CaBP was significantly higher in 1 α -OH-CC fed hens as well. Uterine CaBP was not affected by vitamin D source. Feed consumption was lower in the 1 α -OH-CC than in the CC- or 25-OH-CC-fed hens. The 1 α -OH-CC-fed hens had significantly lowered egg wt. and daily egg mass. Shell wt. and shell density were not affected by vitamin D source. 25-OH-CC did not affect any of the parameters measured. The results show that neither 25-OH-CC nor 1 α -OH-CC affects uterine Ca transport when used at physiological levels, although the latter stimulates Ca absorption considerably. AS

6

A note on microbial growth on hen egg-shells.

Board, R. G.; Loseby, S.; Miles, V. R.

British Poultry Science 20 (4) 413-420 (1979) [21 ref. En] [School of Biol. Sci., Univ. of Bath, Bath BA2 7AY,

UK]

2 strains of cuticle digesting pseudomonads were isolated from the surface of hens' egg-shells that had been stored in a humid (saturated) atm at 25°C. Digestion was due to a protease, the demonstration of which was only achieved in media containing cuticle. The egg-shells were also colonized by yeasts, but the growth of these organisms appeared to be dependent upon the pseudomonads for the release of nutrients from the cuticle. The pseudomonads would not grow on cuticle in situ unless the RH was about 100%. AS

7

Relationship between egg shell quality and shell breakage and factors that affect shell breakage in the field - a review. [Review]

Hamilton, R. M. G.; Hollands, K. G.; Voisey, P. W.; Grunder, A. A.

World's Poultry Science Journal 35 (3) 177-190 (1979) [78 ref. En, fr, de] [Anim. Res. Inst., Res. Branch, Agric. Canada, Cent. Exp. Farm, Ottawa K1A 0C6, Canada]

About 6-8% of the eggs annually produced are broken or cracked between the hen and the consumer's carton. The majority of this breakage is due to interrelationships between egg shell quality and the many biological, environmental and managerial factors which have been individually identified as affecting breakage. Some of the factors associated with shell damage discussed in this review include age of hens, temp. and humidity of the laying house, design of the cage systems and of the cage floors, type of material used to manufacture the cages, frequency of daily egg collection in the laying house and, probably most important, the frequency and quality of handling equipment maintenance. Age and genetic constitution of the hens, environmental temp., and design and quality of equipment maintenance are the major factors that influence shell breakage. There is a curvilinear relationship between shell quality and shell breakage which explains why small changes in shell quality may be associated with large changes in the incidence of breakage. Published data indicate the incidence of breakage may range from as low as 1-2% to 35% or more for other egg producers. AS

8

Factors influencing blood steroid hormone levels in relation to egg shell quality.

Abdullah, R. B.

Dissertation Abstracts International, B 40 (4) 1546: Order no. 79-21951, 140pp. (1979) [En] [Louisiana State Univ. & A&M Coll., Baton Rouge, Louisiana 70803, USA]

The effects of oviposition time, oviposition interval, clutch size, egg production, hen age (12 vs. 24 months), dietary Ca level (2.50, 3.15 or 3.50%) and environmental temp. (24° or 32°C) on serum steroid hormone concn. of hens and shell quality of eggs were studied, together with the interrelation of serum steroid hormone level and egg shell quality. The results show that egg shell quality is best for young hens, oviposition late in the day, oviposition interval < 24 h or > 26 h, high dietary Ca level, and a thermoneutral environment.

Relationships of serum steroid hormone levels to shell quality differed between different times of day; effects of oestradiol and of progesterone were opposite. AJDW

9

Influence of added manganese, magnesium, zinc, and calcium level on egg shell quality.

Holder, D. P.; Huntley, D. M.

Poultry Science 57 (6) 1629-1634 (1978) [11 ref. En] [Dep. of Poultry Sci., Clemson Univ., Clemson, S. Carolina 29631, USA]

3 experiments were conducted to study the effects of dietary Ca level, with the addition of Mn, Mg or Zn, on the performance of Leghorn hens. In the first experiment, Mn, Mg, or Zn was added to diets containing either 2.5 or 3.5% Ca and fed for 12 periods of 28 days. The highest Ca level significantly improved sp. gr. and numerically improved hen-day production, feed conversion, and shell thickness. Ca level also had a significant effect on Mg, Mn and Zn content of the shells. The addition of Mn improved shell thickness, especially when compared to the addition of Mg or Zn. In Experiment 2, Zn was added to a 3.6% Ca diet at levels of 0, 200, or 400 mg/kg. These levels had no significant effect on any parameters studied. Forced-moulted hens in Experiment 3 were fed a 3.6% Ca diet to which was added either 1% Ca (as oyster shell), 180 mg Mn/kg, or both. The additions of Ca significantly improved shell thickness and sp. gr. AS

10

Proceedings of the Maryland Nutrition Conference for Feed Manufacturers, March 16-17, 1978.

[Conference proceedings]

United States of America, University of Maryland; United States of America, Maryland Feed Industry Council Incorporated; United States of America, American Feed Manufacturers Association iv + 120pp. (1978) [many ref. En] Maryland, USA; University of Maryland. Price \$1.50

Papers presented at the Maryland Poultry Nutrition Conference are given and include: The effects of ammoniated aflatoxin contaminated corn on domestic farm animals, by A. C. Keyl (pp. 11-18, 4 ref.) which discusses the possible transference of reaction products from the edible tissues of swine, cattle, poultry and eggs to human consumers. Calcium appetite in chickens, by W. J. Mueller, A. Pro-Martinez, I. G. Joshua & B. Lobaugh (pp. 82-87, 15 ref.) with data given for effects on egg wt. and shell thickness. The threatened status of growth promotants for livestock and poultry, by R. H. White-Stevens (pp. 87-101) which reviews effects of growth promotants on the human diets. Effects of monensin on performance and volatile fatty acids in ruminants, by E. C. Leffel (pp. 111-115, 21 ref.) with effects of monensin on carcass composition. SP

11

[Use of Ovosan for washing egg shells.]

Tiecco, G.

Industria Alimentari 18 (11) 803-805 (1979) [6 ref. It, en]

To combat contamination of egg shells, a potential health hazard particularly during the manufacture of egg products, 0.2–1.2% Ovosan (based on silica and alkyl lauryl sulphonates) was used to wash shells of eggs naturally or artificially contaminated (with hen faeces, *Escherichia coli*, or *Salmonella typhimurium*). All concn. of Ovosan reduced contamination; best results from the microbiological viewpoint were obtained with the 1.0% concn., but 0.6% is recommended as this combined satisfactory microbiological results with best removal of dried faeces and final shell appearance. HBr

12

Method for decorating the shells of eggs.

Growe, G. H.; Patterson, M. P.; Egberg, D. C.

United States Patent 4 181 745 (1980) [En]

Shells of eggs are dyed by wetting selected portions with an aqueous vinegar solution and applying a dry granular dyeing medium, comprising dye and rock salt. The method may be performed in a plastics bag or by sprinkling the dyeing medium over the eggshell. SP

13

The effects of age and strain on the relationships between destructive and non-destructive measurements of eggshell strength for White Leghorn hens.

Hamilton, R. M. G.; Thompson, B. K.; Voisey, P. W.

Poultry Science 58 (5) 1125–1132 (1979) [22 ref. En]

[Eng. & Statistical Res. Inst., Res. Branch, Agric. Canada, Cent. Exp. Farm, Ottawa, K1A 0C6 Canada]

Sp. gr., egg and shell wt., compression fracture force (SBS), and non-destructive deformation (DFM) were measured and % shell, surface area, and shell wt./unit surface area were calculated for a total of 3868 eggs obtained from 4 strains of Single Comb White Leghorns when the hens were 182, 315, 364, and 497 days of age. Strain and age influenced the measured and calculated variables with SBS and DFM showing the greatest differences. Analyses of variance showed that the y-intercepts and the slopes of linear regression equations of SBS on DFM were significantly affected by strain and age. Multiple regression analyses demonstrated that DFM most frequently accounted for the greatest portion of the variability in SBS. These results indicate that although non-destructive deformation is a useful predictor of shell breaking strength, the relationship is affected by strain and age of hen. AS

14

The effect of temperature on the resistance of the hen's egg shell to fracture under impact and compression and to deformation under non-destructive forces.

Voisey, P. W.; Hamilton, R. M. G.; Thompson, B. K.

Poultry Science 58 (5) 1149–1153 (1979) [11 ref. En]

[Eng. & Statistical Res. Inst., Res. Branch, Agric. Canada, Ottawa, Ontario K1A 0C6 Canada]

Precise measurements of the impact and compression force required to fracture egg shells at temp. ranging from -5° to $+45^{\circ}\text{C}$ indicated that shell strength

increases linearly with decreasing temp. Similarly, shell deformation under non-destructive forces increases linearly with decreasing temp. These findings have implications in both laboratory test procedures and commercial production systems: strict control of shell temp., and rapid cooling of eggs to promote shell strength. AS

15

[Effects of beryllium compounds on the hen. IV. Long-term effects of BeSO_4 on egg shell quality.] Die Wirkungen von Beryllium-Verbindungen auf das Huhn. IV. Langzeiteinflüsse von Berylliumsulfat auf die Eischalenqualität.

Hatjipanagiotou, A.; Engels, J.; Fricke, M.; Krampitz, G.; Lesur, E.; Hardebeck, H.; Flajs, G.

Archiv für Geflügelkunde 43 (4) 159–164 (1979)

[17 ref. De, en, fr, ru] [Inst. für Anatomie, Physiol. & Hygiene der Haustiere, Univ., Bonn, Federal Republic of Germany]

1-yr feeding trials on the effects of unspecified low and high levels of supplementation of the diet of laying hens with BeSO_4 on egg shell quality are described. The results are presented diagrammatically. Low-level Be supplementation of the diet tended to increase shell strength and shell thickness, increased carbonic anhydrase activity in the shell, and decreased deposition of low mol. wt. constituents in the shell; effects of high dietary Be levels were the reverse of those of low Be levels. Effects on shell elasticity differed between the polar and equatorial axes of the eggs. [See *Archiv für Geflügelkunde* (1979) 43, 93–96 for part III.] AJDW

16

The effect of washing eggs under commercial conditions on bacterial loads on egg shells.

Moats, W. A.

Poultry Science 58 (5) 1228–1233 (1979) [7 ref. En]

[USDA, SEA, AR, Agric. Res. Cent., Beltsville, Maryland 20705, USA]

Thirty-three sample sets, each consisting of washed and unwashed eggs, and washwater were collected from 4 commercial egg grading plants in Maryland and S.E. Pennsylvania. The 4 plants used different combinations of washing compounds and sanitizing or water rinses. Bacterial loads on eggs were determined both by a surface rinse method and by a method involving evacuating and blending the shells (EB). Total plate counts at 22° and 37°C were not significantly different. Surface counts on washed eggs in plants using sanitizing rinses were frequently very low ($< 50/\text{shell}$) and were significantly lower than in one plant using water rinse. However, when the sanitizer was temporarily cut off in plants using a sanitizing rinse, surface counts on washed eggs were as low as before, indicating that any beneficial effect of the sanitizer was indirect. Correlations between bacterial counts of washwater and of washed eggs were low but significant. Further examination of the data indicated that little if any contamination of eggs by washwater occurred in most cases. Bacterial counts on selective and differential agars showed generally low but variable numbers of coliforms and enterococci and substantial numbers of micrococci on the shells. *Salmonellae* were isolated from 2 lots of unwashed eggs and one of washed eggs, all by the EB method. AS

17

Influence of feeding and husbandry on egg shell quality.

Folkerts, J.

Poultry International 17 (7) 114, 116, 120, 122, 124 (1978) [En, de, fr, es, it] [Spelderholt Inst. for Poultry Res., Beekbergen, Netherlands]

Aspects covered in this discussion of factors influencing shell quality of eggs include: losses due to breakage of eggs; breakage directly after lay; effects of cage design and mechanization of egg collecting systems; hen age; time of day at which eggs are laid; dietary Ca, P, Mg and vitamin E levels; Ca source; acid/base balance; the role of vitamin D₃ and its metabolites; causes of pimpled and mottled shells; effects of heat stress; effects of cage vs. floor housing; and the potential for future improvements in shell quality. AJDW

18

The hen's egg: evidence on the mechanism relating shell strength to loading rate.

Carter, T. C.

British Poultry Science 20 (2) 175-183 (1979) [12 ref. En] [Agric. Res. Council's Poultry Res. Cent., King's Buildings, W. Mains Road, Edinburgh EH9 3JS, UK]

The decrease in strength of an egg shell which is known to accompany an increase in the period of time over which a load is applied might come about by either of 2 mechanisms: a decrease in the strength of the material constituting the strong, outer layer of the mineral shell, or a decrease in the thickness of this layer brought about by deepening of the crevices that are normally present between adjacent crystal columns in the weak, inner layer of the shell. Experiments designed to discriminate between these mechanisms are described; the results indicate the 2nd mechanism. This mechanism offers explanations for various other shell phenomena, including delayed fracture under a static, cyclical or recurrent load. The main implication for the poultry industry is that any external insult to a shell is likely to weaken it by doing damage that is local, internal, irreparable and cumulative, even though it may be invisible from the outside. AS

19

The relationship between some characters of egg shell quality and their relationship to other egg quality traits.

Abdel-Kader, Y. M.; Wezyk, S.

Roczniki Naukowe Zootechniki 6 (2) 49-55 (1979) [12 ref. En, pl, ru] [Res. Cent., Min. of Agric., Cairo, Egypt]

Studies on the interrelation of shell quality characteristics (egg sp. gr., shell wt., shell thickness) were conducted using a total of 1500 eggs laid by purebred or crossbred White Leghorn hens, at five 8-wk periods during the 1st year of laying. The results show that these 3 shell quality characteristics were significantly correlated at all 5 periods. Correlation coeff. between sp. gr. and shell wt. ranged from 0.447 to 0.815; correlations between sp. gr. and shell thickness ranged from 0.402 to 0.917; and correlations between

shell wt. and shell thickness ranged from 0.446 to 0.865. Egg wt. was significantly correlated with shell wt. ($r = 0.476-0.780$), but not with egg sp. gr. or shell thickness. Egg shape index was not significantly correlated with the shell characteristics studied. AJDW

20

Eggshell crack detector.

Staalkat BV

British Patent 1 556 101 (1979) [En]

Cracks in eggshells are detected by rotating an egg positioned within a light beam and employing an apparatus having a photodetector and 2 oval mirrors for beam deflection. IFT

21

[Strengthening of eggshells.]

Nippon Haigo Shiryō Co. Ltd.

Japanese Examined Patent 5 444 739 (1979) [Ja]

Coating compositions for strengthening eggshells comprise mixtures of CaSO₄, a wax, a gum arabic paste and a solvent. IFT

22

[Egg preservation.]

Taka Shokuhin Kogyo

Japanese Examined Patent 5 501 019 (1980) [Ja]

The freshness of eggs is maintained by coating the surfaces of the shells with an edible oil. IFT

23

The avian eggshell - a resistance network.

Board, R. G.

Journal of Applied Bacteriology 48 (2) 303-313 (1980) [37 ref. En] [School of Biol. Sci., Univ. of Bath, Bath, BA2 7AY, Avon, UK]

Functions of the egg shell are considered, dealing with pore function, pore flooding; the shell as a resistance network, practical implications, and terminology. AL

24

The nutritional value of rapeseed meal for caged layers.

Hulan, H. W.; Proudfoot, F. G.

Canadian Journal of Animal Science 60 (1) 139-147 (1980) [14 ref. En, fr] [Res. Sta., Agric. Canada, Kentville, Nova Scotia B4N 1J5, Canada]

1536 Single Combed White Leghorn pullets of 2 commercial genotypes ((i) and (ii)) were fed soybean meal (SM), Tower or Candle rapeseed meal (RSM) during either the growing or laying period or both, at 10, 15 or 20% replacement level. Lighting was reduced gradually from 40 lux for the 1st 24 h to 0.5 lux from 22 to 140 days old; during laying lighting was maintained on a daily photoperiod of 14 h light of approx. 10 lux. The following egg traits were measured: egg wt., shell strength (sp. gr.) and interior quality (Haugh units), and results are tabulated. Egg wt. of genotype (ii) was significantly ($P < 0.01$) heavier than (i). At 224 and 308 days, eggs laid by birds fed a control diet during growing and laying were significantly

heavier than those fed diets containing RSM; egg size was significantly smaller with RSM diets. Sp. gr. of eggs was higher for genotype (i) than (ii), and at 224 days hens fed 20% Candle RSM during growing and 10% Candle RSM during laying had significantly higher sp. gr. than hens fed the same diet but with 15% Candle RSM during the laying period. Haugh units were significantly higher in eggs laid by genotype (ii) than (i), and there were no significant effects of dietary regimen on Haugh units at 210 or 322 days. At 497 days Haugh units of birds fed control diets or 20% Candle RSM during growing + 10% Candle RSM during laying were significantly higher than those of eggs of other dietary regimens. SP

25

A method of surveillance for bacteria on the shell of turkey eggs.

Arhienbuwa, F. E.; Adler, H. E.; Wiggins, A. D. *Poultry Science* 59 (1) 28-33 (1980) [16 ref. En] [MANR Vet. Div., Benin City, Midwest State, Nigeria]

The sterile adhesive tape procedure for estimating the bacterial population on the surface of turkey eggs was established. A total of 484 eggs were sampled with 1.8 cm × 1.6 cm sterile tapes on a dispenser; two, three, or five impressions were made on agar plates, and the number of organisms on the eggshell was calculated. It was shown that two, three or five taping impressions were equally adequate for estimating the total number of bacteria on the eggshell. This method was also used to establish that sanitizing eggs with a quarternary ammonium compound was more effective than formaldehyde gas fumigation. The total bacterial count using the taping technique was on average lower than that determined by the complete wash technique. By regression of log total bacterial count by the wash method on log total bacterial count by the taping method, a more accurate measurement was obtained. AS

26

[Studies on determination of optimum dietary level of phosphorus for poultry. III. Effects of level of phosphorus on performance of laying hens.]

Han, I. K.; Sohn, K. S.; Kim, J. I.; Kim, C. S. *Korean Journal of Animal Science* 22 (2) 135-142 (1980) [28 ref. Ko, en] [Coll. of Agric., Seoul Nat. Univ., Suweon, Seoul, Korea]

200 twenty-one wk old White Leghorn laying hens were fed diets containing (i) 0.43, (ii) 0.53, (iii) 0.62, (iv) 0.72 or (v) 0.81% total P for 24 wk in order to determine optimum dietary level of P. Results, presented in tables, were for (i)-(v) resp.: average egg wt. 54.3, 54.8, 55.1, 55.3 and 54.7 g; % shellless eggs 1.20, 0.90, 0.85, 0.91 and 1.15; shell thickness 0.363, 0.363, 0.368, 0.361 and 0.365 mm; % total ash content of egg shell (DM basis), 99.02, 97.14, 97.36, 97.15 and 97.00; and % Ca content of egg shell (DM basis), 37.86, 37.88, 38.00, 37.91, and 38.04. It was concluded that (iii) in laying diets was adequate for the performance of laying hens. [From En summ.] SP

27

Effects of density in cages on egg production, feed for dozen eggs and egg quality studies.

Ravindra Reddy, V.; Varadarajulu, P.; Subba Rao, K. V.; Appa Rao, V.; Chandra Reddy, V. R. *Indian Veterinary Journal* 56 (1) 49-52 (1979) [8 ref. En] [Dep. of Poultry Sci., Coll. of Vet. Sci., Tirupati, AP, India]

160 Single Comb White Leghorn laying hens (22 wk of age at the start of the trial) were used in a study on effects of floor space/bird in the laying cage (1800, 900, 600 or 450 cm², i.e. 1, 2, 3 or 4 birds/cage) on laying performance and egg quality. Tables of data are given, including values for egg wt., Haugh unit score, shell thickness and incidence of blood spots. Higher incidence of blood spots was observed at low than at high space allowance/bird; no significant effect of space allowance on egg wt., Haugh unit score or shell thickness was observed. AJDW

28

[Effects of chlorinated hydrocarbons on the shell characteristics of Japanese quail eggs. I. Effects of DDT and its metabolites.]

Die Wirkung chlorierter Kohlenwasserstoffe auf die Eischalenqualität der japanischen Wachtel (*Coturnix c. japonica*). I. Der Einfluss von DDT und seinen Metaboliten.

Hartner, L.; Faber, H. von

Archiv für Geflügelkunde 44 (2) 57-61 (1980) [10 ref. De, en, fr, ru] [Inst. für Zoophysiol., Univ. Hohenheim, 7000 Stuttgart 70, Federal Republic of Germany]

Groups of Japanese quails (*Coturnix coturnix japonica*), 5 wk of age at the start of the trial, were fed diets with additions of 250 p.p.m. of organochlorine compounds (o,p'-DDT, p,p'-DDT, p,p'-DDE, p,p'-DDD or p,p'-DDA). Weekly egg production, egg wt., breaking strength, shell thickness, wt. and sp. gr., egg surface area, and shell wt./mm² surface area were determined; tables of results are given and presented in detail. Most shell quality characteristics were impaired by the organochlorine compounds studied; the greatest % decreases were observed for weekly egg production and breaking strength. The relative magnitudes of effects of the individual organochlorine compounds on shell quality are also considered. AJDW

EGG WHITES

1

[Method for the calculation of water vapour pressure above foodstuffs with a wide range of water contents.]

Latyshev, V. P.; Agafonychev, V. P.

Kholodil'naya Tekhnika No. 12, 35-37 (1978) [5 ref.

Ru] [Vses. Nauchno-issled. Inst. Kholodil'noi

Promyshlennosti, USSR]

The possibility of applying the basic conditions of thermodynamics of solutions for the assessment of partial pressure of water vapour in products of various water contents was tested over a wide temp. range. The corresponding equations are given for the calculation of water vapour pressure at 283-320°K. The reliability of the method was tested using freeze-dried beef, quarg, egg white and yoghurt. STI

2

Effect of enzymes addition on foamability of egg-white products.

Niewiarowicz, A.; Trojan, M.

Acta Alimentaria Polonica 5 (1) 39-48 (1979) [23 ref.

En, pl] [Inst. Tech. Zywnosci Pochodzenia Zwierzecego AR, Poznan, Poland]

Effects of pancreatin, trypsin, Amylopol P (a preparation from *Aspergillus oryzae*) and α -amylase (at respective levels of 120, 113, 57.5 and 37.2 mg/150 ml sample of egg white) on whipping properties of frozen egg white, pan-dried egg white (dried in a chamber at 40-45° to a moisture content of about 8%) and obtained from both unfrozen and frozen whites, and spray-dried albumen (Niro Atomizer laboratory unit to a moisture content of 6.8-8.5%) were investigated. Freezing did not lower the foaming ability of egg white, while pasteurization (57-58°C for 90 s) substantially reduced it. Desugaring with glucose-oxidase-catalase preparations intensified foaming ability of egg white products. Addition of pancreatin significantly enhanced foaming properties of all the products and unfrozen white. Trypsin improved foaming ability of frozen white but had no effect on pan-dried or spray-dried egg white compared with desugared white. Amylopol P increased foaming ability of frozen but not powdered egg white. α -Amylase had a good effect on frozen white and pan-dried albumen but did not increase foaming ability of egg white powder. No significant effect of added enzymes was observed on stability of foam from egg white products. AL

3

A simple, enzymic test for monitoring the efficient thermal pasteurization of chicken egg-white.

Monsey, J. B.; Jones, J. B.

Journal of Food Technology 14 (4) 381-388 (1979)

[9 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

A simple, rapid test was developed to monitor the efficient thermal pasteurization of a single sample of egg white. The starch-degrading enzyme activity of 72 individual raw egg whites and 18 samples of commercial bulked raw egg white was determined. The enzyme was found in all samples and the variation between bulked samples was small. The enzyme was

virtually completely destroyed when egg white was pasteurized at 57.2°C (135°F) for 2.5 min, which are the conditions currently in use commercially in the UK. A sample of egg white, pasteurized for 2.5 min, failed the test if the temp. fell below 56°C or the sample contained > 0.15% w/w yolk, or the sample was contaminated after pasteurization with > 2% w/w of raw egg white. Storage of raw or pasteurized samples for up to 9 months at -20°C or of egg-in-shell for up to 20 days at 20°C did not alter the enzyme activity. The test can be completed in 75 min and several tests can be run simultaneously. AS

4

Chromatography and electrophoresis of native and spray-dried egg white.

Galyean, R. D.; Cotterill, O. J.

Journal of Food Science 44 (5) 1345-1349 (1979) [En]

[Dep. of Food Sci. & Nutr., Univ. of Missouri-Columbia, Columbia, Missouri 65211, USA]

Effects of the spray-drying process on egg white proteins were studied by DEAE-cellulose ion-exchange chromatography and polyacrylamide gel electrophoresis. Major chromatographic peaks of native egg white were characterized by electrophoresis. Chromatograms and electrophoretograms of native egg white were compared to those of egg white which was adjusted to various pH levels, then spray-dried. Changes in spray-dried egg white protein patterns were minor, even at pH levels where conalbumin is heat sensitive. Egg white globulin proteins appear most sensitive to the spray-drying process. Large-scale denaturation of egg white protein does not occur during spray-drying, but may initiate changes in the protein which affect the functional properties of rehydrated products. Globulin proteins require further characterization in order to properly describe their electrophoretic and chromatographic behaviour. IFT

5

Degradation of the O-glycosidically linked carbohydrate units of ovomucin during egg white thinning.

Kato, A.; Ogino, K.; Kuramoto, Y.; Kobayashi, K.

Journal of Food Science 44 (5) 1341-1344 (1979)

[24 ref. En] [Dep. of Agric. Chem., Fac. of Agric., Yamaguchi Univ., Yamaguchi, Japan]

β -elimination reaction of the O-glycosidically linked carbohydrate units of ovomucin was followed by determining the increase of unsaturated amino acid and chromogen of glycopeptide I in alkaline solution. The Arrhenius plot for β -elimination reaction gave an activation energy of 23 kcal/mol. During egg white thinning the O-glycosidically linked carbohydrate units were gradually liberated from serine or threonine residues in ovomucin. It was proposed that the liberation of O-glycosidically linked carbohydrate units might cause the deterioration of ovomucin gel structure during storage of egg. IFT

6

Action of egg white lysozyme on *Clostridium tyrobutyricum*.

Wasserfall, F.; Teuber, M.

Applied and Environmental Microbiology 38 (2) 197-199 (1979) [7 ref. En] [Inst. of Microbiol., Fed. Dairy Res. Cent., D-2300 Kiel, Federal Republic of Germany]

Egg white lysozyme (at a concn. of 500 U/ml) was able to kill 99% of 5×10^5 resting vegetative cells of *C. tyrobutyricum* within 24 h of incubation at 25°C. Spores were completely resistant to lysozyme. Proliferating vegetative cells were severely inhibited, although lysozyme-resistant cells developed in growing cultures in the presence of lysozyme. Whereas early stages of spore germination (loss of optical refractility and heat resistance) were not inhibited by lysozyme, the overall outgrowth of spore cells into vegetative cells was delayed by 1 day in the presence of 500 U of lysozyme/ml. This delay was independent of the lysozyme sensitivity or resistance of the mother culture of the used spores. It is suggested that this inhibition by lysozyme of the outgrowth of spore cells into vegetative cells of the lactate-fermenting *C. tyrobutyricum* is the basis for the observation that lysozyme can substitute for nitrate in preventing the "late gas" defect of Edam- and Gouda-type cheeses. AS

7

[New test apparatus for measurement of firmness of viscous foams of foods.] Eine neue Prüfvorrichtung zur Messung der Festigkeit viscoser Schäume von Lebensmitteln.

Pichert, H.

Zeitschrift für Lebensmittel-Untersuchung und -Forschung 169 (4) 284-289 (1979) [8 ref. De, en] [Inst. für Ernährungswissenschaft in Weihenstephan, Tech. Univ. München, D-8050 Freising-Weihenstephan, Federal Republic of Germany]

Shortcomings in the present apparatus used for measurement of foam firmness are described. A plunger is allowed to fall through the foam, and its rate of descent is timed from marks engraved on it. Deviations from the vertical introduce frictional forces giving unreliable results; only limited information about the nature of the foam is obtained from the single time measurement, and the method is unsuitable for 'soft' foams such as whipped egg white. A new apparatus is described in which a plunger, instead of being allowed to fall through a guide, is attached to a rotating arm. The angle of elevation of the arm is measurable electronically, and can be continuously recorded. Successful application of the apparatus to whipped cream and egg white is described. DIH

8

[Process for obtaining from whey a product which froths up like white of egg.]

Paquet, D.; Thou, K. S.; Alais, C. (France, Agence Nationale de Valorisation de la Recherche (ANVAR))

French Patent Application 2 403 031 (1979) [Fr]

An egg-white substitute suitable for human consumption is obtained from whey containing 2-15% protein, possibly a product of ultrafiltration or dialysis, which is brought to a pH of 2-6, heated to 45-80°C over 1-10 min and kept at this temp. for 5-20 min. The product is rapidly cooled to 15-25°C and brought to pH 7-9, and is then suitable for whipping and can be used for making biscuits, pastries, etc. W&Co

9

Variation in gross components, yolk lipid and yolk cholesterol content of eggs during pullet year production in Australorp.

Chand, D.; Georgie, G. C.; Razdan, M. N.

Indian Journal of Poultry Science 13 (2) 73-77 (1978) [13 ref. En] [Dep. of Anim. Production Physiol., Haryana Agric. Univ., Hissar-125 004, India]

Egg albumen, yolk and shell wt., and yolk lipid and yolk cholesterol contents were recorded monthly during the pullet yr (i.e. 6-18 months of age) production from hens of the Australorp breed. A highly significant increase was recorded for all the traits over the 1-yr period, but the increase during the 1st 5 months was not significant. The average wt. of egg, albumen, yolk, and shell were 48.56, 30.13, 14.08, and 4.42 g, resp.; the yolk lipid value was 319.38 mg/g yolk (or 4.5 g/yolk) and the yolk cholesterol value was 22.72 mg/g yolk (or 312.27 mg/yolk). The max. cholesterol value was recorded in Nov. (age 13 months) when the birds were moulting. CFTRI

10

Chemical inhibition of Gram negative organisms.

Pickens, H. L.; Banwart, G. J.

Abstracts of the Annual Meeting of the American Society for Microbiology 79, 215 (1979) [En] [Ohio State Univ., 190 North Oval Drive, Columbus, Ohio 43210, USA]

The effect of EDTA on the viability of certain Gram-negative bacteria was determined. Reduction of *Salmonella typhimurium* in 0.01M phosphate buffer at pH 7.2 and 8.5 supplemented with various concn. of EDTA with and without lysozyme was determined by the standard plate count method. The plate count revealed little difference in cell destruction whether or not lysozyme was present. Various salmonellae, *Escherichia coli*, and *Pseudomonas fragi* were added to sterile egg white supplemented with various concn. of EDTA. Addition of 5.0 mg EDTA/ml resulted in a reduction of 10^6 - 10^7 organisms/ml in <24 h at 25°C. Agitation during incubation did not increase the death rates obtained. Supplementation of liquid whole egg with up to 25.0 mg EDTA/ml had little effect on the viability of *S. typhimurium*. An attempt to recover sublethally stressed cells was performed using a medium containing additional divalent cations necessary for cell growth. Additional colonies were not recovered on this medium. AS

11

Method for processing soy protein and composition of matter.

Davidson, R. M.; Sand, R. E.; Johnson, R. E. (Anderson, Clayton & Co.)

United States Patent 4 172 828 (1979) [En]

Defatted soybean flakes are mixed with water and heated to 55-70°C to extract the solubles. The extract liquor is cooled for > 1-3 h to 5-10°C. The resultant curd is separated from the whey, and is preserved by freeze- or spray-drying. The whey may be processed by a series of steps generally involving precipitation of additional curd, washing or redissolution of the curd, adjustment of pH, and drying. 4 distinct protein

fractions result, each having differing and unique physical and/or functional properties. Applications include production of imitation cheese, gelling agents and egg white substitute. HBr

12

Heat induced changes in sulphhydryl levels in egg white.

Beveridge, T.; Arntfield, S.

Canadian Institute of Food Science and Technology Journal 12 (4) 173-176 (1979) [13 ref. En, fr] [School of Food Sci., Macdonald Coll., Sainte Anne de Bellevue, Quebec H0A 1C0, Canada]

Levels of sodium dodecyl sulphate available sulphhydryl (SH_{ds}) and heat exposed sulphhydryl (SH_c) were measured in egg white using Ellman's reagent. SH_{ds} levels decreased both with increasing time (0-40 min) and temp. (75° and 90°C) of heating. SH_c levels initially showed a marked increase followed by a slower decline over the same time period. The effect was more marked with increasing temp. O_2 flushing of the system prior to heating caused a marked loss of SH_{ds} and a greatly accelerated loss of SH_c while N_2 flushing accorded considerable protection to both types of SH groups. At pH values between 4 and 10, SH_{ds} levels decreased as before although more slowly at pH 4, 5, and 6 than at pH 7 and 8. At pH 9 and 10 alkaline hydrolysis of disulphide (S-S) was encountered. SH_c showed less initial increase at pH 4, 5, and 6 than at pH 7 and 8 and the decline following exposure was slower. Gel filtration on Sepharose 4B demonstrated increasing polymer concn. eluting at the void volume at the expense of "native" albumen with increasing time and temp. of heating. AS

13

Long-term feeding effects of browned egg albumin to rats.

Kimiagar, M.; Lee, T. C.; Chichester, C. O.

Journal of Agricultural and Food Chemistry 28 (1) 150-155 (1980) [24 ref. En] [Dep. of Food Sci. & Tech., Univ. of Rhode Island, Kingston, Rhode Island 02881, USA]

Browned egg albumen, produced by Maillard reaction between glucose and albumen at 37°C for 10 days, was fed to rats for 1-12 months, and wt. gain, organ wt. and various biochemical parameters were studied. No differences between rats fed the browned albumen and the control group were observed after 1 month, wt. gain lags were observed after 2 months, and after longer periods, alterations in serum enzyme activities and organ wt. were observed. Poor nutritional quality of browned protein was concluded to be due to more than the simple loss of amino acids, and the cumulative pattern of effects observed resembled that of exposure to toxins. Browned albumen produced physiological changes that would not be detected by chemical or short-term nutritional studies normally applied to processed foods. DIH

14

A comparison of the rheological properties of heat-induced protein gels from egg albumen and bovine plasma. [Lecture]

Hickson, D. W.; Dill, C. W.; Morgan, R. N.; Sweat, V. E.; Carpenter, Z. L.

Journal of Animal Science 49 (suppl. 1) 25 (1979) [En] [Texas A&M Univ., College Station, Texas 77843, USA]

Spray-dried protein concentrates were prepared from edible blood plasma by a desalting process and as phosphate complexes. The heat induced gel strength of these proteins was compared to that of egg albumen using an Instron testing device. Comparisons were made at 8% protein concn. and heating was at 80°C for times up to 120 min. Varying concn. of NaCl and $CaCl_2$ were applied to each type of protein. Blood plasma gels exhibited a higher effective viscosity than egg albumen gels at all concn. of NaCl and $CaCl_2$. A comparison of the differences in gels due to pH adjustment revealed that phosphated blood plasma exhibited the highest level of effective viscosity at pH 7, non-phosphated blood plasma at pH 7 and egg albumen at pH 9. A comparison of monovalent vs. divalent cations showed the effective viscosity with all protein gels responded most to divalent cations. [See FSTA (1980) 12 7S1061.] AS

15

[Effects of hen strain and egg storage on egg quality, especially proteins of the thin and thick albumen.]

Herkunfts- und Lagerungseinflüsse auf die innere Equalität, insbesondere die Proteine im dünnen und dicken Eiklar.

Scholtyssek, S.; El-Bogdady, A.

Archiv für Geflügelkunde 43 (6) 245-252 (1979) [15 ref. De, en, fr, ru] [Lehrstuhl für Kleintierzucht, Univ. Hohenheim, 7000 Stuttgart 70, Federal Republic of Germany]

Eggs laid by hens of 3 strains (Shaver, Hisex, LSL) were stored for 2, 9 or 16 days at 5°C or 19°C. Quality characteristics (wt. loss, albumen height, yolk index, % shell, % yolk, % total albumen, % thick albumen, % thin albumen, pH, and contents of individual protein fractions in the thin and thick albumen) were determined for the stored eggs. Tables of results are given. All 3 variables significantly influenced all the quality characteristics studied. The results are discussed in detail, with special reference to differences in protein fraction concn. in the albumen. Eggs laid by the 3 hen strains differed in the ovomucoid, ovalbumin and lysozyme contents of the albumen. Thin and thick albumen differed in protein fraction concn. Ovalbumin and conalbumin concn. increased and lysozyme concn. decreased with increasing storage time. Storage at 5°C gave higher ovalbumin 2 and lower conalbumin concn. than storage at 19°C. Storage time \times temp. interaction significantly influenced concn. of most albumen protein fractions. AJDW

16

Long-term feeding effects of Maillard brown products to rats.

Kimiagar, M.

Dissertation Abstracts International, B 40 (6) 2612: Order no. 79-15460. 116pp. (1979) [En] [Univ. of Rhode Island, Kingston, Rhode Island 02881, USA]

Egg albumin, browned in the presence of glucose (albumin/glucose ratio 3:2) at 37°C and 68% RH for

10 days, was freeze-dried and incorporated into a diet at the 10% level (diet A). This diet was fed to rats for 1, 3, 6 or 12 months. The results obtained were compared to those for rats fed either a normal 10% egg albumin diet ad lib. (diet B) or a 5% egg albumin diet designed to resemble diet A (diet C). Rats fed diets A and C showed similar wt. gains for the first month, and assays of serum components and tissue enzyme activities showed no significant differences between the 2 diets. After 2 months, wt. gain was less with diet A than with diet C and the rats fed diet A had increased organ wt. (e.g. liver, kidneys, caecum, stomach, testes), decreased haematocrit and haemoglobin values, and increased values for blood urea N, serum glucose, serum glutamate-oxalate transaminase, serum alkaline phosphatase and urine sp. gr.; these effects intensified as the feeding period increased. After 12 months on diet A, various abnormalities were noted in the liver and kidneys. A recovery experiment indicated that the damage inflicted by long-term ingestion of diet A might be irreversible. Male rats were generally more susceptible to the harmful effects of diet A than females. JA

17

[Dried egg product.]

QP Corp.

Japanese Examined Patent 5 500 023 (1980) [Ja]

A dried egg white product is described which has high foaming ability upon reconstitution in water and no lipase activity, thus preventing the development of bad odours. IFT

18

[Powdered egg product.]

QP Corp.

Japanese Examined Patent 5 500 022 (1980) [Ja]

A dry powdered egg albumen product is described from which sugar has been removed and which has good whisking properties. IFT

19

Sodium dodecyl sulfate-polyacrylamide gel electrophoresis of chromatographically fractionated egg white.

Galyean, R. D.; Laney, J. A.

Journal of Food Science 45 (3) 460-462 (1980) [En]
[Dep. of Food Tech., Coll. of Agric. Sci., Texas Tech. Univ., Lubbock, Texas 79409, USA]

Analytical electrophoretic methods were used to observe heterogeneity in chromatographic isolates of native egg white proteins (NEW). NEW was fractionated by carboxymethylcellulose chromatography. Isolates were analysed by polyacrylamide gel electrophoresis (PAGE) and SDS-PAGE. Considerable heterogeneity was noted in several fractions thought previously to contain pure components. PAGE resulted in 7 G_3 globulins eluted with ovalbumin A_3 . These uncharacterized globulins had mol. wt. of 58 000. Several unknown components of large mol. wt. (100 000-200 000) were eluted by alkaline buffers. Chromatography in conjunction with

electrophoresis yielded several unidentified proteins requiring further characterization. IFT

20

Thermal coagulation of egg albumin.

Shimada, K.; Matsushita, S.

Journal of Agricultural and Food Chemistry 28 (2) 409-412 (1980) [18 ref. En] [Res. Inst. for Food Sci., Kyoto Univ., Kyoto, Japan]

Turbidity was used to study thermocoagulation of egg albumin as a function of pH and protein concn. Coagulation was dependent on pH and protein concn. The net charge of egg albumin at the critical pH ($h_T = 0.5$) upon coagulum formation increased linearly with protein concn. The 1st step of coagulation reaction involved formation of disulphide bonds and the exposure of hydrophobic groups. During further heating, egg albumin was polymerized by intermolecular sulphhydryl-disulphide exchange and the protein network structure was formed. The high net charge of proteins prevented the matrix from forming mainly by hydrophobic interaction. Succinylated egg albumin acted in a similar way with unmodified protein regarding relationship between protein concn. and critical pH ($h_T = 0.5$) upon coagulation. AS

21

The decrease in UV absorbance, and the specific viscosity of egg-white, with time of cold-storage.

[Lecture]

El-Sherbieny, A. M.

Bulletin de l'Institut International du Froid 59 (4) 1190-1191 Abstr. C2-3 (1979) [En, Fr] [Dep. of Food Sci., Fac. of Agric., Monofia Univ., Shebiene El-Kome, Egypt]

UV absorption of fresh thin egg-white solution in borate buffer was measured at 198 nm. Frozen samples at -50°C were thawed and UV absorbance measured again. Other frozen samples were cold-stored at -5° and -20°C ; samples were thawed at 22°C weekly and UV absorbance re-examined. Fresh in-shell eggs were used as controls to measure the specific viscosity of thin and thick egg-white. Other fresh in-shell eggs were frozen in the cold-store at -5° and -20°C . UV absorbance, due to freezing and thawing, increased suddenly at first from 2.377 to 2.676, but with time of cold-storage it steadily decreased until the end of the 42-day experiment to 2.389 at -5°C and to 2.403 at -20°C . Specific viscosity decreased with freezing and cold-storage for 10 wk, from 162.5 to 103.5 for thick egg-white and from 1.65 to 1.01 for thin egg-white at -5°C , and from 162.5 to 32 for thick egg-white and from 1.65 to 0.49 for thin egg-white at -20°C . Accordingly, such parameters may be tried as indices for time of cold-storage and tried for other foodstuffs. [See FSTA (1980) 12 9G615.] AS

22

[Method for forming foams usable for food and feed applications.] Verfahren zur Bildung von auf dem Nahrungs- und Futtermittelgebiet verwendbaren Schäumen.

Sorg, E.
German Federal Republic Patent Application
 2 824 911 (1979) [De]

Food material e.g. egg white, caseinate or maize gluten in water, is subjected to pressure of preferably 40–400 bar, air or gas is whipped in at a temp. of 60–80°C, and the product is expanded to form a solid foam. W&Co

23

Oxidised lipids-proteins browning reaction. V. Effect of spices on the browning of lipid-protein mixtures.

El-Zeany, B. A.; Abdel-Fattah, L. E.
Rivista Italiana delle Sostanze Grasse 56 (11) 438–440 (1979) [14 ref. En, it] [Fac. of Pharmacy, Cairo Univ., Cairo, Egypt]

The antioxidant effect of spices on the browning of model systems (unsaturated fatty acids and proteins) was studied. Powdered capsicum, black pepper and cumin added at 1.5% w/w to egg albumin and mixed with 10% unsaturated fish oil methyl esters delayed the autoxidation during storage at 60°C, especially during the first 4 h. The onset of browning was delayed and its extent reduced. Benzidine and peroxide values were similarly affected. Black pepper and cumin were more effective than capsicum. [See also following abstr., and FSTA (1979) 11 6N251 for part III.] -RM

24

[Kjeldahl nitrogen determination using different catalysts.] Kjeldahl-Stickstoffbestimmung mit verschiedenen Katalysatoren.
 Ugrinovits, M.

Mitteilungen aus dem Gebiete der Lebensmitteluntersuchung und Hygiene 71 (1) 124–140 (1980) [27 ref. De, en, fr] [Wander AG Zentralanalytik, Nahrungsmittelforschung & Entwicklung, CH-3176 Neuenegg, Switzerland]

Replacement of the currently used and highly toxic Hg/Se catalyst by the 'Missouri' catalyst ($K_2SO_4 + CuSO_4$) in Kjeldahl N detn. was investigated. Necessary alterations to digestion time and temp. are described, as the reaction is slower with the Missouri catalyst. A number of food products were analysed by the Hg/Se and Missouri methods; results are tabulated. The Missouri catalyst performed at least as well as, and in some cases better than, the Hg/Se catalyst. Collaborative tests of 4 catalysts (Hg/Se, Cu/Se, Cu/TiO₂ and Missouri) were performed on egg white. Results are tabulated showing N content (mean of 5 detn.) s.d., distribution range, and confidence intervals. The Missouri catalyst gave the highest N yields with the same precision as the other catalysts. DIH

25

Separation of a soy-spun fiber, egg albumen, and wheat gluten blend by sodium dodecyl sulfate gel electrophoresis.

Rizvi, S. S. H.; Josephson, R. V.; Blaisdell, J. L.; Harper, W. J.
Journal of Food Science 45 (4) 958–961 (1980) [En]
 [Dep. of Food Sci. & Nutr., Ohio State Univ., Columbus, Ohio 43210, USA]

Commercial soy spun fibre, egg albumen, wheat gluten, and a mixture of these proteins were subjected to a variety of electrophoretic techniques to find a procedure that could separate, detect, and characterize components of the individual proteins in a simulated meat analogue system. Of the techniques utilized, sodium dodecyl sulphate polyacrylamide gel electrophoresis (SDS-PAGE) provided the only effective separation of the protein components. Sample handling conditions in the SDS-PAGE dispersion solution included the use of heat, 2-mercaptoethanol (ME), and centrifugation. Samples centrifuged prior to electrophoresis gave superior patterns to those not centrifuged. Heat treatment of samples had no noticeable effect on separation patterns. Protein separation and resolution for all 3 protein sources were clear and distinct but considerably different in samples without and with added ME, the latter tending to decrease mol. wt. components. While a majority of the protein components of soy-spun fibre, egg albumen, and wheat gluten showed similar mobilities, there were several proteins or protein subunits with distinct mobilities in the presence or absence of ME. Therefore, SDS-PAGE could be used to separate and identify these proteins and to study processing induced changes in commercial meat analogues containing blends of these proteins. IFT

26

Recovery of foam stability of yolk-contaminated egg white by immobilized lipase.

Kobayashi, T.; Kato, I.; Ohmiya, K.; Shimizu, S.
Agricultural and Biological Chemistry 44 (2) 413–418 (1980) [19 ref. En] [Dep. of Food Sci. & Tech., Nagoya Univ., Nagoya 464, Japan]

7 kinds of lipase were immobilized to Sepharose 4 B, porous glass beads or ion-exchange resins. Lipase immobilized to porous glass beads was most suitable for the treatment of yolk-contaminated egg white. Optimum pH and temp. were not varied by the immobilization. Immobilized lipoprotein lipase from *Pseudomonas fluorescens* and lipase from *Rhizopus delemar* were applied to treatment of yolk-contaminated egg white. Foam stability of spray-dried egg white solution containing 0.05% yolk was completely recovered by the 30 min treatment with either immobilized lipase. This demonstrated the feasibility of improving the foaming properties of yolk-contaminated egg white by immobilized lipase treatment. AS

27

Assessment of rat growth methods for estimating protein quality: interlaboratory study.

McLaughlan, J. M.; Anderson, G. H.; Hackler, L. R.; Hill, D. C.; Jansen, G. R.; Keith, M. O.; Sarwar, G.; Sosulski, F. W.

Journal of the Association of Official Analytical Chemists 63 (3) 462–467 (1980) [22 ref. En] [Bureau of Nutr. Sci., Health & Welfare Canada, Tunney's Pasture, Ottawa, Ontario, Canada K1A 0L2]

An interlaboratory study involving protein efficiency ratio (PER), net protein ratio (NPR), relative NPR (RNPR) and relative N utilization (RNU) was carried

out. 6 collaborators assayed 6 samples, i.e. lactalbumin, egg white, wheat gluten (WG), soybean protein isolate (SPI), WG + SPI, and also casein + methionine as a reference protein. Collaborators prepared their own diets and analysed the diets for N. Test proteins were added at the 8% level ($N \times 6.25$). PER values varied more than NPR values which varied more than either RNPR or RNU. RNU and RNPR produced almost identical values, but RNPR remains the official method of choice, because it is a well established method. AS

28

[Preservation of dried egg white using propionic acid bacteria.]

Lobzov, K. I.; Stoyanova, L. G.

Myasnaya Industriya SSSR No. 12, 23-25 (1979)

[13 ref. Ru] [Nauchno-proizvodstvennoe Ob"edinenie Ptitsepererabatyvayushchei Promyshlennosti

'Kompleks', USSR]

A major cause of spoilage of dried egg white during storage is presence of sugars, which take part in formation of melanoidins (causing browning and significant changes of flavour). The levels of melanoidins after 6, 12 and 18 months of storage increased to 16.1, 28.0 and 50.0 mg/g resp. Removing sugars either by a glucose oxidase/catalase system or by fermentation with propionic acid bacteria significantly improved shelf life of dried egg white; levels of melanoidins in treated egg white after 18 months storage increased to only 18.8 mg/g. Presence of melanoidins in dried egg whites decreases solubility by 13.6%, and decreases foam stability by 4.2%. STI

29

[Evaluation of laying hen rations containing alfalfa protein concentrate.]

Pailhe, L. A.; Popolizio, E. R.; Fernandez, E.; Ricci, H. R.

Miscelanea, Universidad Nacional de Tucuman

Facultad de Agronomia y Zootecnia No. 71, 11pp.

(1978) [7 ref. Es, en] [Fac. de Agron. & Zootecnia, Univ. Nacional de Tucuman, Tucuman, Argentina]

30 Concord Cobb laying hens, 32 wk of age at the start of the trial, were used in an 11-wk investigation on effects of diets with 0, 1 or 2.5% alfalfa protein concentrate (replacing alfalfa meal) on laying performance and egg quality. Tables of results are given, including data for number of eggs/bird, egg wt., yolk colour, yolk index and Haugh unit score of the albumen. The best results were obtained by feeding 1% alfalfa protein concentrate. No adverse effect of the alfalfa protein concentrate on egg quality was observed; yolk colour improved slightly with increasing level of this protein source in the diet. AJDW

EGG YOLKS

1

Process for obtaining yolk lecithin from raw egg yolk. Yano, N.; Fukinbara, I.; Tanako, M. (Asahi Kasei Kogyo Co. Ltd.)

United States Patent 4 157 404 (1979) [En]

A process for obtaining yolk lecithin from raw egg yolk is described which comprises extraction with liquid dimethyl ether, whereby a lecithin rich fraction is obtained as a separate phase from neutral lipids fraction. IFT

2

[Hens' eggs with increased linoleic acid content.] Jensen, E.

Livsmedelsteknik 20 (2) 72-74 (1978) [Da]

To determine whether the content of polyunsaturated fat in egg yolk could be increased satisfactorily by dietary means, 300 hens were divided into 4 groups which were fed a standard diet with 0 (control), 3.5, 5.5 or 7.5% soy oil. The eggs were analysed by gas chromatography for linoleic acid content, and for taste after storage at 5° or 20°C. A costs analysis was also carried out. After a stabilization period (i.e. after the diet had been given for 12-27 days), the linoleic acid content of the yolks (approx. 300 from each group) was 8.0-12.4, 13.9-18.3, 18.3-22.6 and 22.6-27.0%, for the diets with increasing oil content, resp. Shelf life of all the eggs was satisfactory at both storage temp. (although naturally shorter at 20°C), and there were no significant inter-group quality (taste) differences. It is concluded that 7.5% soy oil (or slightly less) may satisfactorily be incorporated into hens' diets. HBR

3

Stereospecific analysis of glycerolipids of egg yolk of Japanese quail (*Coturnix coturnix japonica*).

Suyama, K.; Adachi, S.; Sugawara, H.; Honjoh, H.

Lipids 14 (8) 707-709 (1979) [10 ref. En] [Lab. of Anim. Products Tech., Fac. of Agric., Tohoku Univ., Sendai 980, Japan]

Phosphatidylcholine, phosphatidylethanolamine and triacylglycerol were isolated from egg yolk of the Japanese quail. Fatty acid composition at the 2 and 3 positions of glycerol in the glycerolipids were determined by stereospecific analysis employing phospholipase A₂. The distribution of the total number of C atoms in the fatty acid moieties of triacylglycerol was also quantitated by high temp. GLC. The distribution of acyl groups in each of the positions of the phosphatidylcholine, phosphatidylethanolamine and triacylglycerol was not random, and each position has a characteristic composition. The phosphatidylcholine and phosphatidylethanolamine had distinctive fatty acid distributions for position sn-2 of the triacylglycerol had a predominance of unsaturated fatty acids of which 18:1 (69.9%) was the major component. Position sn-3 contained 49.3% saturated fatty acids and was more saturated than position sn-1 by 8.1%. The experimentally determined distribution of the C numbers in triacylglycerol deviated significantly from the distribution predicted by 1-random-2-random-3-random association of the fatty acids. The data suggest that in Japanese quail there is marked preferential synthesis of some triacylglycerols. AS

4

Influence of environmental conditions on egg yolk lipids.

Vives, F.; Sancho, J.; Gomez-Capilla, J. A.; Osorio, C. *Grasas y Aceites* 30 (3) 165-168 (1979) [14 ref. En, es, de, fr] [Fac. de Med., Granada, Spain]

The difference in lipid composition of egg yolks from free-range and commercially kept hens (under constant temp., humidity, lighting and diet) were investigated. Tabulated results showed that eggs (but not egg yolks) from free-range animals were heavier, contained more total lipid, lower % of triglycerides, sphingomyelins and lysolecithins, equal % of total but less of esterified cholesterol, higher % of oleic, and significantly lower % of linoleic acid in the phospholipids and triglycerides. Other differences in fatty acid composition were not significant. The differences in linoleic acid contents were attributed to the diet. The results support the contention that yolk lipids may be affected by the environment. RM

5

[Solubility of egg yolk lipids in an aqueous ethanol medium.]

Milewski, J.; Rutkowski, A.

Zeszyty Naukowe Szkoły Głównej Gospodarstwa Wiejskiego Akademii Rolniczej w Warszawie, Technologia Rolno-Spozywca No. 12, 95-102 (1978) [7 ref. Pl, ru, en] [Inst. Tech. Zywnosci, SGGW-AR, Warsaw, Poland]

Lipids were extracted from egg yolk using a 1:1 chloroform/methanol mixture, the extract was freed from solvent in a 'Quickfit' rotary evaporator at <45°C, and 0.5 g portions of the lipids were shaken for 1 min at room temp. with 5 ml water/ethanol mixtures containing 0, 25, 50, 75 or 96 vol.% ethanol. The phases were separated by centrifugation in a Janetzky VAC601 ultracentrifuge at 60 000 gn for 2 h (0.1 g CaCl₂·6H₂O being added to the 25% ethanol mixture extract); the aqueous alcohol layer was removed and extraction was repeated ≤ 5 x. The insoluble lipids were dissolved in chloroform/methanol (95:5) and fractionated by silica gel TLC using chloroform/methanol/water/1% ammonia at 170:70:7:2 to separate the phospholipids which were then quantitatively determined by densitometry. Data on lecithin and cephalin solubilities in the different water/ethanol mixtures are graphically presented; they were very similar, ranging from complete extraction by the 1st portion of 96% ethanol to 3-4% extraction by the 1st portion of 25% ethanol. It is pointed out that this is the approx. proportion of ethanol used by the spirits industry in manufacture of egg emulsion creams, and it is considered that at their low solubility in such emulsions, lecithin and cephalin cannot be responsible for their instability. SKK

6

A study of turkey egg yolk. I. Composition and electrophoretic separation of components.

Cunningham, F. E.; Lee, H. W.

Journal of Food Biochemistry 2 (3) 251-257 (1978, publ. 1979) [35 ref. En] [Dep. of Anim. Sci. & Ind., Kansas State Univ., Manhattan, Kansas 66506, USA]

Proximate composition of egg yolks from Broad

Breasted Large White turkey hens was determined to be as follows (% yolk wt. \pm s.d.): solids 53.62 ± 0.13 , lipid 33.25 ± 0.58 , protein 16.72 ± 0.49 , P 0.58 ± 0.00 , and ash 1.64 ± 0.00 . Corresponding values for chicken egg yolk are 51.30, 32.60, 16.60, 0.588 and 1.10. Turkey egg yolks and White Leghorn chicken egg yolks were compared by disc-gel polyacrylamide gel electrophoresis. Depending on the gel system used, turkey egg yolk was resolved into 10–11 bands and chicken egg yolk into 11–12 bands. Lipovitellins were thought to account for the major species difference in gel patterns. DIH

7

[Dietary protein and egg quality. II. Effects of dietary proteins on the organoleptic properties of eggs and the free amino acid content of the yolk.]

Colas, B.; Sauvageot, F.; Harscoat, J.-P.; Sauveur, B. *Annales de Zootechnie* 28 (3) 297–314 (1979) [11 ref. Fr, en] [Sta. de Recherches Avicoles, Cent. de Tours, INRA, Nouzilly, 37380 Monnaie, France]

Effects of 6 dietary protein sources, (i) field peas, (ii) field beans, (iii) fish meal, (iv) lucerne protein, (v) meat + bone meal and (vi) *Spirulina* algae [see preceding abstr. for details of levels of use] on the organoleptic properties of eggs and the free amino acid content of the yolk were investigated. Organoleptic properties of raw and soft-boiled eggs were evaluated by a trained panel using a descriptive analysis procedure covering odour, flavour, presence of an after-taste, and overall quality score. Tables of results are given. The results show that (iii), (iv) and (vi) impaired the organoleptic properties of the eggs, (i) improved the organoleptic properties of the eggs, whereas (ii) and (v) had little effect. Differences in the organoleptic properties of the yolk were observed only for soft-boiled eggs, whereas differences in organoleptic properties of the albumen were observed in both raw and soft-boiled eggs. Diet-related differences in free amino acid compositions of the yolk were small, and not clearly related to differences in organoleptic properties. AJDW

8

[Hydrocarbons of hens' egg yolk.]

Ushakova, T. M.; Eller, K. I.; Medvedev, F. A.; Aksyuk, I. N.; Vorob'eva, L. Sh.; Fedotova, N. Yu. *Voprosy Pitaniya* No. 3, 69–74 (1979) [14 ref. Ru, en] [Inst. Pitaniya AMN SSR, Moscow, USSR]

Using the methods described in FSTA (1979) 11 4A281, egg yolks from 30 boiled eggs from hens fed on traditional rations were analysed. Gas chromatograms are presented and mass-spectrographic characteristics of steranes are tabulated. Contents/kg fresh yolk were: alkanes and cycloalkanes, 15–30 mg; n-alkanes, 1–3 mg; squalene, 15–17 mg; and monocyclic arenes, approx. 1 mg. SKK

9

[Search for 3'-epilutein [(3R,3'S,6'R)- β , ϵ -carotene-3,3'-diol] and 3'-O-didehydrolutein [(3R,6'R)-3-hydroxy- β , ϵ -carotene-3'-one] in egg yolk, in flowers of *Caltha palustris* and in autumn leaves.] Eine Suche nach

3'-Epilutein (= (3R,3'S,6'R)- β , ϵ -carotene-3,3'-diol) und 3'-O-Didehydrolutein (= (3R,6'R)-3-Hydroxy- β , ϵ -Carotene-3'-on) in Eigelb, in Blüten von *Caltha palustris* und in Herbstblättern.

Buchecker, R.; Eugster, C. H.

Helvetica Chimica Acta 62 (8) 2817–2824 (1979) [29 ref. De, en] [Organisch-Chem. Inst., Univ. Zürich-Irchel, Winterthurerstrasse 190, CH-8057 Zürich, Switzerland]

3'-O-didehydrolutein was detected in egg yolk and in flowers of *C. palustris*, while 3'-epilutein was detected in flowers of *C. palustris* but not in egg yolk. Neither compound was detected in the carotenoid fraction of autumn leaves. RM

10

[The characterization of yolk protein by means of isoelectric focusing on a thin layer of gel.]

Charakterisierung der Proteine des Hühnereigelbs mit Hilfe der Isoelektrofokussierung auf Dünnschichtgel. Vitez, L.

Hrana i Ishrana 20 (5/6) 225–232 (1979) [5 ref. Sh, en] [Kemijski Inst. "Boris "Kidric", Ljubljana, Yugoslavia]

An isoelectric focusing technique (on 7.5% polyacrylamide gel) is described, for separation of water-soluble proteins of hens' egg yolk. This method permits fractionation of the egg yolk into > 15 components. 8 fractions, with isoelectric points in the range pH 4.5–5.5, were clearly separated; other fractions, with isoelectric points at higher pH, were less clear and present at lower concn. This technique was applied to studies on changes in water soluble yolk proteins during storage and freeze-drying of eggs. The results show changes in the fractions with isoelectric points at pH > 5.5, as a result of storage. No effect of freeze-drying on the water-soluble yolk proteins was observed. IN

11

Egg yolk extender.

Chess, W. B. (Stauffer Chemical Co.)

United States Patent 4 182 779 (1980) [En]

An egg yolk extender is described comprising a mixture of defatted soy flour, a food grade oil, a grain flour, lecithin and a thickening gum, with the oil and lecithin providing a total lipid content of 14–24% by wt. IFT

12

[Residues of Amprolium in hen tissues and in eggs.]

Rückstandsverhalten von Amprolium im Huhn und im Ei.

Petz, M.; Vogt, H.; Thier, H.-P.

Archiv für Geflügelkunde 43 (5) 200–204 (1979) [11 ref. De, en, fr, ru] [Inst. für Lebensmittelchem., Univ., 4400 Münster, Federal Republic of Germany]

45 young LSL hens (26.5 wk of age at the start of the trial) were used in a study on accumulation and persistence of residues of the coccidiostat Amprolium in tissues and in egg yolk. The birds were fed diets with (i) 0.0125 or (ii) 0.025% Amprolium for ≤ 32 days. Tables and graphs of results are given showing residue concn. after feeding Amprolium for various periods, and changes in residue concn. after withdrawal of dietary

Amprolium. Residue concn. in egg yolk increased rapidly to approx. 1.3 mg/kg for (i) or 2.0 mg/kg for (ii), then remained approx. constant; residue concn. in the egg yolk decreased to <0.1 mg/kg within 7-8 days after withdrawal of dietary Amprolium. Max. Amprolium residue concn. recorded in hen tissues were, for (i) and (ii), resp. (mg/kg); liver, 0.80 and 1.10; breast muscle, 0.13 and 0.29; leg muscle, 0.12 and 0.27; heart, not detectable and 0.41; skin, 0.12 and 0.30; and fatty tissue, 0.18 and 0.62. Residue concn. in hen tissues decreased to <0.1 mg/kg within 3 days after withdrawal of dietary Amprolium. Storage and cooking had no effect on Amprolium concn. in edible tissues. AJDW

13

Mineral composition of yolk fractions and whole yolk from eggs of restricted ovulator hens.

Grau, C. R.; Roudybush, T. E.; McGibbon, W. H. *Poultry Science* 58 (5) 1143-1148 (1979) [15 ref. En] [Dep. of Avian Sci., Univ. of California, Davis, California 95616, USA]

Yolks of eggs laid by hens with the sex-linked restricted ovulator gene (*ro*) contained less Fe and Cu and more Na and K than control yolks. P levels did not differ significantly. The granule fraction of RO yolks contained less Fe and Mn than controls; the supernatant contained more Na, K, Mg, Zn and Fe than controls. It is suggested that a relationship exists between the effects of the *ro* gene on Fe metabolism and the known hyperlipaemia of RO hens. The yolk ring structure of laid RO eggs was completely disrupted but rings were found in follicular yolks. AS

14

[Determination of the egg yolk content of mayonnaise and emulsified sauces.] Bestimmung des Eigelbgehaltes in Mayonnaise und emulgierten Sossen. Stüven, K.

Ernährungswirtschaft No. 11/12, 38 (1979) [De]

2 methods are described for detn. of egg yolk in mayonnaise, etc. One method is based on extraction with a benzene/ethanol mixture, evaporation of the solvent off the extract, re-dissolving the residue in benzene/ethanol, filtration, ashing of the filtrate, and photometric analysis by the vanadate-molybdate reagent method; a blank is necessary. The other method is based on extraction with chloroform/ethanol, ashing of the extract and gravimetric detn. by the phosphorus-quinoline method; no blank is needed in this method. The first method is suitable for egg yolk contents of 3.0-7.5%, the second for egg yolk contents of 1.0-7.0%. IN

15

[Capillary gas chromatographic separation of residues of chlorinated hydrocarbons in foods and identification of Mirex in human fat tissue.] Kapillargaschromatographische Trennung von Rückständen an Chlorkohlenwasserstoffen in Lebensmitteln und Identifizierung von Mirex in menschlichem Fettgewebe. Schulte, E.; Acker, L.

Nahrung 24 (6) 577-583 (1980) [20 ref. De, en, ru] [Inst. für Lebensmittelchem., Westfälischen Wilhelms-Univ., Münster, Federal Republic of Germany]

Problems with inadequate GLC separation of organochlorine insecticides, hexachlorobenzene and polychlorinated biphenyls are briefly considered. Development of a capillary-column gas chromatographic method, using a SE-30/SE-52 (1:1) coated column is described; peaks are identified by MS. This technique permits separation of all chlorinated hydrocarbons likely to occur in foods, and their identification at µg/kg concn. Chromatograms are given, illustrating separation of chlorinated hydrocarbons present in egg yolk and human fat. IN

16

Metabolism of [¹⁴C]zearalenone in laying hens.

Dailey, R. E.

Journal of Agricultural and Food Chemistry 28 (2) 286-291 (1980) [8 ref. En] [Div. of Toxicology, FDA, Beltsville, Maryland 20705, USA]

A single dose of 10 mg [¹⁴C]zearalenone/kg was administered by gavage to White Leghorn laying hens, and its absorption, distribution, and excretion at 2, 4, 24, 48, and 72 h after dosage were studied. ¹⁴C-Labelled residues in excreta, bile, egg yolk, clutch, and liver were partially characterized. No major retention sites of ¹⁴C activity were found in edible muscle tissues but persistent levels of lipophilic metabolite(s) were detected in egg yolk at a concn. of 195 µg-equiv./100 g wet wt (about 2 p.p.m.) 72 h after dosing. AS

17

Studies on freeze-thaw gelation of very low density lipoprotein from hen's egg yolk.

Kurisasi, J.; Kaminogawa, S.; Yamauchi, K.

Journal of Food Science 45 (3) 463-466 (1980) [En]

[Dep. of Agric. Chem., Univ. of Tokyo, Bunkyo-ku, Tokyo 113, Japan]

Disruption of lipid-protein complexes in egg yolk very low density lipoprotein (VLDL) during freezing and thawing was studied chemically and morphologically. Upon rapid freezing and thawing, gelation did not occur and VLDL particles only clustered. Nevertheless, some of the VLDL constituents were liberated from particles. On either slow freezing or slow thawing, aggregation was complete and gelation occurred. Also in this case, VLDL fragments were liberated. The liberated fraction was rich in protein and phospholipids which surround the neutral lipid core. Thus, on freezing and thawing, disruption of the surface that stabilizes the particulate nature of VLDL initially occurs. In conclusion, gelation might be attributed to aggregation of disrupted VLDL particles which finally induces formation of a mesh-type structure. IFT

18

Comparison of concentrated pigment sources for laying diets.

Waldroup, P. W.; Burke, A.; Slagter, P.; Bussell, W. *Poultry International* 18 (4) 42, 44, 111, 115-116 (1979) [En, de, it, es fr, ja, ar] [Anim. Sic. Dep., Univ. of Arkansas, Fayetteville, Arkansas 72701, USA]

A brief account is given of studies on the value of conc. dietary pigment sources for improvement of the colour intensity of egg yolks. Laying hens were fed

milo-based diets supplemented with β -apocarotenoid acid ethyl ester (BACA) as a control, or with marigold meal or the proprietary preparations Pigmentene, Florafil or Gold'n Bloom at levels calculated to give 15, 30, 45, 60, 90 or 120 mg added xanthophyll/kg feed. Data are given for Roche Fan colour scores and NEPA scores of the yolks of eggs laid after 21 days on the experimental diets. Pigmentene had the greatest colouring effect of the proprietary supplements tested; levels used in this study were higher than required to give the optimum colour intensity, and imparted an undesirable red tone to the yolks. Florafil gave the next highest colour intensity, followed by Gold'n Bloom and marigold meal. In a second study, laying hens were depleted of yolk pigments, then fed diets supplemented with either BACA or Pigmentene to give added xanthophyll concn. of 2.5–30.0 mg/kg in the diet. The results show that 15–25 mg xanthophyll/kg diet from Pigmentene gave good yolk colour without undesirable red coloration. AJDW

19

A note on the effect of fertilization on egg yolk cholesterol content in White Leghorn.

Chand, D.

Indian Poultry Gazette 63 (4) 169–170 (1979) [4 ref. En] [Dep. of Anim. Production Physiol., Coll. of Anim. Sci., Haryana Agric. Univ., Hissar-125 004, India]

30 infertile and 20 fertile eggs were collected from the same birds, fed a layer diet prepared in a single batch. The cholesterol concn. recorded in yolks of fertile eggs was slightly, but not significantly, higher than that recorded in those of infertile eggs (23.9 ± 1.24 vs. 20.8 ± 0.80 mg/kg wet wt.). The values for the wt. of egg, yolk, albumen, and shell differed little between fertile and infertile eggs. CFTRI

20

[Use of bean protein in diets for poultry.]

Pailhe, L. A.; Ricci, H. R.; Popolizio, E. R.; Castellote, H. F.; Amin, C. A.

Miscelanea, Universidad Nacional de Tucuman Facultad de Agronomia y Zootecnia No. 70, 20pp. (1978) [22 ref. Es, en] [Fac. de Agron. & Zootecnia, Univ. Nacional de Tucuman, Tucuman, Argentina]

90 hens were used in a 16-wk study on effects of partial replacement of sunflower seed and soybeans in the diet by waste kidney beans (*Phaseolus vulgaris*): dietary levels of 0, 5 and 12% beans were studied. Data are presented showing effects on laying performance, feed efficiency and yolk colour. No significant differences attributable to diet were observed. In a second trial, 140 hens were used in a 16-wk feeding trial on diets containing sunflower seed, soybeans, beans, soybeans + beans, sunflower seed + beans or sunflower seed + soybeans + beans. Data are given for laying performance, feed efficiency, and egg wt. and colour. No significant effect of diet on egg wt. was observed. Diets containing beans, except the sunflower seed/bean diet, tended to give slightly more intense yolk colour than the other diets. AJDW

21

[Evaluation of 3 local products for colouring of egg yolks.]

Pailhe, L. A.; Fernandez, E.; Popolizio, E. R.; Ricci, H. R. *Miscelanea, Universidad Nacional de Tucuman Facultad de Agronomia y Zootecnia* No. 68, 16pp. (1978) [18 ref. Es, en] [Fac. de Agron. & Zootecnia, Univ. Nacional de Tucuman, Tucuman, Argentina]

400 hens (previously fed a low-pigment diet) were used in a feeding trial conducted to evaluate effects of (i) alfalfa protein concentrate, (ii) alfalfa meal and (iii) nettle meal (each fed at 1, 5 or 10% of the diet) on yolk colour. A control diet containing canthaxanthin at 8 g/t was used as a control. Diagrams are given showing the yolk colour intensities of eggs laid by hens subjected to the various treatments. The results show that (i) gave the greatest yolk colour intensity, followed by (iii). Yolk colour intensity increased with increasing level of pigment source in the diet. AJDW

22

Yolk cholesterol in eggs from various avian species.

Bair, C. W.; Marion, W. W.

Poultry Science 57 (5) 1260–1265 (1978) [21 ref. En] [Dep. of Food Tech., Iowa State Univ., Ames, Iowa 50011, USA]

Studies were conducted to establish differences in yolk cholesterol concn. in eggs from various avian species. Species listed in order of increasing concn. of cholesterol/g of yolk, were guinea fowl, chicken, pheasant, quail, turkey, duck, goose, and dove with an overall range of 12.77–21.99 mg cholesterol/g of yolk. Significant differences in cholesterol concn. also were found between domestic and wild genetic groups for turkeys and ducks. In a second study, eggs from 7 inbred lines of chickens showed significant differences in yolk cholesterol. The same general result was found in an analysis of eggs from 17 commercial test strains of chickens at 2 different ages. Yolk cholesterol tended to decrease as age of hen increased. These results confirm the possibility of genetically selecting for decreased yolk cholesterol if economic or other conditions warrant. The increased efforts required to decrease yolk cholesterol by this approach would undoubtedly be expensive. AS

POULTRY

1

Breeding manufacturer's mobile laboratory offers on-spot product demonstrations.

Anon.

Quick Frozen Foods 40 (5) 41-42 (1977) [En]

A description is given of a mobile miniature processing plant specially built for Richmond Baking Company, of Richmond, Indiana, a manufacturer of breeding for frozen meat, fish, poultry and vegetable products. The processing plant, which is installed in a 28 ft long van, duplicates the operation of the full-size, production line models. The portable processing operation is complete with refrigeration, automated breeding application and cooking equipment. The breedings can be applied to the processor's own product at his plant. This eliminates the shutdown of the processors on-line breeding machine, time-consuming cleanup and filling up to the processors machine with one of the breedings. VJG

2

Vacuum poultry eviscerating.

Harben, G. S.; Graham, K. Z. (Stork-Gamco Inc.)

United States Patent 4 153 972 (1979) [En]

Vacuum poultry eviscerating apparatus is described in which the vacuum tool is provided with a body cavity spacing means to maintain an air space between the tool and the body cavity to prevent collapse during use. IFT

3

Vent cutting apparatus.

Meyn, P.

United States Patent 4 155 146 (1979) [En]

Poultry vent cutting apparatus is described which employs a centre pin adapted to be inserted into the vent opening, and a hollow cylindrical knife concentrically rotatable about the centre pin. IFT

4

Poultry processing.

Andersen, B. C.

UK Patent Application 2 004 175A (1979) [En]

Apparatus is described for the separation of poultry livers and hearts from guts and gall bladder. IFT

5

Stunner for poultry.

Simonds, M. E. (Stork-Gamco Inc.)

United States Patent 4 153 971 (1979) [En]

Poultry hanging head down from a conveyor are wetted with an electrolyte and conveyed to an electrical poultry stunning trough. IFT

6

Composition of drainage from thawed poultry carcasses.

Cunningham, F. E.; Suderman, D. R.; Wu, M. H.

Poultry Science 58 (2) 365-368 (1979) [13 ref. En.]

[Dep. of Anim. Sci. & Ind., Kansas State Univ.,

Manhattan, Kansas 66506, USA]

Frozen turkeys, baking hens, broilers, and Rock Cornish Game hens, processed and frozen commercially, were purchased from a local wholesaler. The turkey hens were 24 wk. old, the baking hens were 21 months, broilers 8 wk., and Rock Cornish Game hens 5 wk. The frozen carcasses were thawed overnight and the drainage collected, weighed, and analysed. Both the birds and containers were well covered with Al foil to minimize evaporation. The total fluid loss from the thawed birds ranged from 3.7% of the carcass wt. of turkeys to 7.1% of the total wt. of Rock Cornish Game hens. Drainage from various classes contained 4.0-6.6% solids. Protein in the drainage ranged from 3.6 to 5.2%. Fat content in the drained fluids was highest (0.15%) from turkey hens and lowest (0.10%) from baking hens. Ash content in the drainage was highest from the youngest birds (the Cornish hens) and lowest from turkey hens. Mineral analysis of the drainage showed that K and Ca in the ash remained constant for all classes of poultry. In the drainage from chickens, there was significantly more Fe from older birds but more Cu and Zn from younger birds. Amino acid analysis of the drainage revealed a greater loss of essential amino acids from older birds. Drainage from turkeys contained less tryptophan than drainage from chickens. Tyrosine was nearly absent in drainage from broilers. AS

7

[Poultry meat hygiene.] Geflügelfleischhygiene. [Book] Grossklaus, D.

xi + 351pp. ISBN 3-489-68016-2 (1979) [many ref. De] Hamburg, Federal Republic of Germany; Verlag Paul Parey; Price DM 120.00 [Inst. für VetMed. (Robert von Ostertag-Inst.) des Bundesgesundheitsamtes, Berlin]

This comprehensive textbook of poultry meat hygiene includes the following chapters. Poultry meat production and consumption, by D. Grossklaus (pp. 1-4, 9 ref.). Composition and quality of poultry meat, by D. Grossklaus (pp. 5-33, many ref.). Legal aspects, by W. Brühann (pp. 34-83, 2 ref.). Breeding and husbandry of slaughter poultry, by R. Levetzow & D. Grossklaus (pp. 84-102, 14 ref.). Technology and hygiene of slaughter of poultry, by U. Götze (pp. 103-155, many ref.). Inspection of slaughter poultry and their meat, by D. Grossklaus (pp. 157-199, many ref.). Diseases and defects of importance for inspection of slaughter poultry and poultry meat, by D. Grossklaus (pp. 200-294, many ref.). Prohibited feed additives and undesirable residues in poultry meat, by D. Grossklaus (pp. 295-315, many ref.). Available types of poultry and poultry meat products and deteriorative changes in poultry products, by R. Levetzow (pp. 316-328, many ref.). Bacterial food poisoning after consumption of poultry meat or poultry products, by R. Levetzow (pp. 329-339, many ref.). A 10-pp. subject index is given. AJDW

8

Composition of poultry meat from local sources.

El-Dashlouty, M. S.; El-Sidawi, M. H.; Heikal, H. A.; Ali, W. A.

Sudan Journal of Food Science and Technology 10, 19-27 (1978) [13 ref. En.] [Food Tech. Dep., Min. of Agric., Cairo, Egypt]

The composition of meat from thighs and breasts of young and adult male and female chickens, pigeons, geese and ducks was studied. Results for moisture, total N, fat and ash contents are tabulated and briefly discussed. Greatest variations were observed in fat contents, with overall means of 2.12, 3.84, 9.45 and 6.07% (for chickens, pigeons, geese and ducks resp.) RM

9

Composition of poultry meat as affected by nutritional factors. [Lecture]

Summers, J. D.; Leeson, S.

Poultry Science 58 (3) 536-542 (1979) [25 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario N1G 2W1, Canada]

The major aspects of poultry meat composition which are under control by variation in the diet are quantities of protein and fat in the carcass, and the nature of the fat, since protein composition is genetically determined. Vitamin and mineral levels in poultry meat are not influenced by the composition of conventional diets, but feeding of highly unsaturated dietary fats has been shown to result in an increase in the degree of unsaturation of the depot fats. A major problem of the industry is to reduce the proportion of abdominal and visceral fat laid down relative to protein levels; although a certain amount of fat is considered necessary for good eating quality, the deposition of abdominal fat is usually considered wasteful. Experimental results are reviewed, which seem to show that selection of broilers for max. growth rates may in fact be selecting for greater appetite, resulting in birds which eat excessive amounts of feed and lay down the excess as abdominal fat, which accounts for much of the wt. gain. Thus it is suggested that other factors than wt. for age should be taken into account in selection programmes, to maintain acceptable carcass quality. [See FSTA (1980) 12 1G22.] JRR

10

[Physical characteristics of meat of broiler and adult geese.]

Pamula, K.

Medycyna Weterynaryjna 34 (2) 78-80 (1978) [21 ref. Pl] [Inst. Hodowli i Tech. Produkcji Zwierzecej, AR, Krakow, Poland]

Breast and thigh muscles of (i) 30 Zator breed 8-wk old broiler geese and (ii) 30 traditionally fattened (in autumn) 26-wk-old geese from the same hatch were examined, pH being determined 45 min and 24 h after slaughter, and free moisture contents, reflected colour brightness, thickness of muscle fibres and consistometer values were measured immediately. Mean values with s.d. are tabulated for groups of 15 (i) and (ii) males and females as well as significances of differences between (i) and (ii). (i) muscles contained more free moisture, had thinner muscle fibres and were of softer consistency than those of (ii), the differences being significant at $P < 0.01$. SKK

11

Blood level, biological half life, volume distribution and tissue dispersion of sulfaphenazole in poultry.

Banerjee, N. C.; Singh, M. K.; Jha, H. N.; Sinha, S. P. *Indian Poultry Gazette* 63 (1) 19-21 (1979) [6 ref. En] [Dep. of Pharmacology, Bihar Vet. Coll., Patna-14, India]

Compared to many other sulphonamide drugs, Sulfaphenazole has a long-lasting action, and its residual concn. in the edible tissues of poultry remains very high for 48 h. Since it can produce allergic and hypersensitive reactions in man, it is recommended that birds to which the drug has been administered should be withheld from human consumption for at least 15 days after the administration of the last dose. CFTRI

12

Health laws and regulations - Iceland. World Health Organization

International Digest of Health Legislation 29 (3) 579-586 (1978) [En] [Geneva, Switzerland]

A selection of Icelandic health laws and regulations is presented including the following which relate to food hygiene: Order No. 269 of 4 Sept. 1973 on milk and milk products, has been made in pursuance of, inter alia, Law No. 12 of 17 March 1969 concerning health hazards and public health surveillance; Regulations No. 286 of 28 Sept. 1973 on the processing and marking of poultry slaughterhouse products, have been made in pursuance of Law No. 30 of 28 April 1966; and Order No. 243 of 30 July 1974 on levels of nitrites and nitrates in meat, meat products and other slaughterhouse products, has been made in pursuance of Law No. 85 of 31 Dec. 1968. VJG

13

Substances for use in meat and poultry products. United States of America, Food Safety & Quality Service

Federal Register 44 (151, Aug. 3) 45606-45607 (1979) [En] [Washington, DC, USA]

Tertiary butylhydroquinone (TBHQ) may be used under the Federal meat inspection regulations as an approved antioxidant in certain meat and poultry food products at $\leq 0.02\%$ in combination only with BHA and/or BHT, based on fat content. CAS

14

[Poultry meat. Storage, transport and marketing.]

Bulgaria, D'rzhaven Komitet za Standartizatsiya *Bulgarian Standard* BDS 14480-78, 6pp. (1978) [Bg]

Chilled birds shall be stored at 0-2°C and 80-85% RH; storage life is up to 5 days. Frozen birds shall be stored at up to -18°C and 85-90% RH; storage life is up to 6 months (geese up to 4 months). Transport temp. are 0-2° and -18°C for chilled and frozen birds, resp. HBr

15

[Smoked poultry roll, leg and whole carcass.]
Bulgaria, D"rzhaven Komitet za Standartizatsiya
Bulgarian Standard BDS 14588-78, 4pp. (1978) [Bg]

This standard covers constituents of the product, and general requirements, e.g. shape, dimensions, appearance. Specific requirements include: salt, ≤ 3 wt.%; nitrites ≤ 5 mg/100 g; water, ≤ 65 wt.%; pathogens, moulds, coliforms and *Proteus* spp. (in 1 g), no tolerance. Products shall be stored at -1° to $+4^{\circ}\text{C}$; shelf life is 4 days. HBr

16

[Poultry. Requirements for purchase, transport and preslaughter handling.]
Bulgaria, D"rzhaven Komitet za Standartizatsiya
Bulgarian Standard BDS 14591-78, 5pp. (1978) [Bg]

17

Proceedings of the International Symposium on Salmonella and Prospects for Control. [Conference proceedings]
Barnum, D. A. (Canada, University of Guelph; Canada, Department of Health & Welfare) (Editor)
ii + 268pp. (undated) [many ref. En] Ontario, Canada
Price \$10.00

The international symposium held at the University of Guelph, Ontario, Canada, 8-11 June, 1977, was concerned with salmonellae in poultry. Invited papers are published in full; these include Salmonella infection at the farm level, by G. H. Snoeyenbos (pp. 41-47, 18 ref.); The occurrence of salmonellosis in poultry in Denmark in 1935-1975, and the controlling programme established, by H. E. Marthedal (pp. 78-94, 7 ref.); and International Symposium on Salmonella - summary and conclusion, by E. J. Bowmer (pp. 253-258). Also included are summaries of workshop discussions held by delegates at the end of the symposium; these are Production, by H. Carlson (pp. 259-261); Processing, by J. D. Summers (pp. 261-262); and Products, by H. L. Orr (pp. 262-263). Abstracts of 6 contributed papers are published, including The aims, objectives, and structure of the Canadian Poultry Industry Salmonella Committee, by J. D. Mitchell (pp. 264-265). A further 12 invited papers are abstracted individually, and may be found in the FSTA author index under Canada, University of Guelph [Salmonella Symposium]. DIH

18

[Combination cooking of poultry meat emulsion.]
Belyaev, M. I.
Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 1, 59-61 (1979) [6 ref. Ru] [Khar'kovskii Inst. Obshchestvennogo Pitaniya, Khar'kov, USSR]

The emulsion was cooked in laminated (2-component) cellophane, with 10-15% water in the intermediate space. The product was processed in a high frequency cabinet (2×3 min + 3 min thermostat processing between the cooking operations, and 4-min thermostat processing at the end of the process). The process is considerably accelerated. The yield is 11.5%

higher vs. the traditional process, and sensory properties are improved. Amino acids in the finished product are better retained. STI

19

[Effect of brining method on yield and properties of roasted poultry meat.]

Bol'shakov, A. S.; Boreskov, V. G.; Sarycheva, L. A.; Avakyants, B. M.; Makaev, V. M.; Mitrofanov, N. S.; Stoyanov, V. P.

Myasnaya Industriya SSSR No. 2, 16-18 (1979) [Ru]
[Moskovskii Tekh. Inst. Myasnoi i Molochnoi Promyshlennosti, Moscow, USSR]

Effects of brine injection method (using a conventional syringe system, or a high pressure syringeless method) on the yield and quality of roasted poultry meat were studied. The latter method increased the yield and improved the organoleptic properties of the product, and had technical advantages over the conventional syringe system. STI

20

[Quality of goose meat after 2, 3 and 4 years egg laying.]

Faruga, A.; Majewska, T.

Drobiarstwo 27 (4) 17-18 (1979) [Pl]

4-yr old geese, processed after killing, were found to be better than 2-3 yr old geese; the geese lose muscle and subcutaneous fat with age, but inter-muscle fat content rises. Chemical composition of breast muscle is not dependent on age, except for protein content; the difference lies only in wt. The conclusion is that geese 3-4 yr old are economically and nutritionally advantageous. STI

21

Coliforms and *Enterobacteriaceae* isolates from selected foods.

Mercuri, A. J.; Cox, N. A.

Journal of Food Protection 42 (9) 712-714, 711 (1979) [21 ref. En] [Animal Products Microbiol. Res. Unit, USDA, Richard B. Russell Agric. Res. Center, Athens, Georgia 30604, USA]

Coliform counts and *Enterobacteriaceae* counts were obtained using violet red bile agar (VRB) and VRB + 1% glucose (VRBG), resp. of samples of 5 food products. From each set of VRB and VRBG plates, 28-40 'typical' colonies were randomly selected and identified by use of the R-B Enteric Differential System. A pure culture of each isolate was also subjected to the sequential tests for gas production in lauryl sulphate tryptose (LST) and brilliant green lactose bile broths (confirmed coliforms) and in EC broth at 45.5°C (faecal coliforms). IMViC reaction patterns of EC-positive cultures were also determined. Approx. 80% of the VRB isolates from broiler skin and from mechanically deboned poultry meat (MDPM) met all the criteria for faecal coliforms, whereas only 62.5% and 36.5%, resp. of the VRBG isolates from these 2 products met these criteria. Fewer than 10% of the VRB and VRBG isolates from chicken pot pie, ground beef, or pork sausage produced gas in LST broth. % faecal coliforms and *Escherichia coli* (Type I or II) among the 179 VRB

isolates were 34.1 and 33.5, resp. Corresponding % for the 193 VRBG isolates were 20.7 and 19.7. *E. coli* was the predominant sp. isolated on both media from broiler skin and MDPM. *Enterobacter agglomerans* was the principal species isolated from chicken pot pie and pork sausage; *Serratia liquefaciens* predominated in ground beef. AS

22

Salmonellae in Alberta poultry products and their significance in human infections. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38].) [Lecture]

Finlayson, M.

pp. 156-180 (undated) [8 ref. En] [Provincial Lab. of Public Health, Univ. of Alberta, Edmonton, Alberta, Canada]

Results of a survey of salmonella content of samples taken from poultry processing plants and poultry farms in Alberta are presented and discussed. 397 of 785 swabs from processing plants (defeathering, eviscerating, floor and chill tank sites) were positive for salmonella. Salmonella was also frequently detected in broilers, breeders and turkeys on farms. 27 serotypes were isolated, 5 only on farms and 5 only in processing plants. Cross-contamination was inadequately controlled in processing plants. Sub-typing of isolated strains showed that poultry was the major source of human salmonellosis. DIH

23

Control by chlorination. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38].) [Lecture]

Tompkin, R. B.

pp. 122-130 (undated) [27 ref. En] [Swift & Co., Oak Brook, Illinois, USA]

Control of salmonella in poultry by chlorination of processing water is reviewed. Aspects considered include relation between pH and free available chlorine, natural pH of chicken tissues, relation between time of exposure and reduction in bacteria, and effects of chlorination of chill water on carcass bacterial content. Reductions of approx. 90% are concluded to be the max. achievable in practice. DIH

24

An overview of human involvement. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38].) [Lecture]

McCoy, J. H.

pp. 27-40 (undated) [3 ref. En] [Public Health Laboratory, Hull Royal Infirmary, Hull, UK]

The importance of the poultry reservoir in human salmonellosis is discussed, and routes of infection of poultry are described. Studies relating to incidence of contamination of giblets for human consumption, and serotypes of salmonellae isolated are described; differences between serotypes isolated from giblets at packing stations and on receipt at kitchens are discussed. It is concluded that elimination of contamination of poultry carcasses is unlikely to be achieved. DIH

25

Plant and retail control. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38].) [Lecture]

Bryan, F. L.

pp. 181-202 (undated) [60 ref. En] [Centre for Disease Control, Bureau of Training, Atlanta, Georgia 30333, USA]

Factors contributing to outbreaks of salmonellosis are briefly discussed, and major sources of salmonellae in processing of poultry meat from carcass to domestic or food service catering are reviewed. Aspects considered include: role of equipment and workers in handling raw products: destruction of organisms during heat processing, and post-process contamination; and storage, thawing and cooking procedures. Education about possibilities of contamination and subsequent growth of salmonellae is considered necessary for all those handling poultry products. DIH

26

Product contamination with salmonella. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38].) [Lecture]

Pivnick, H.; Handzel, S.; Lior, H.

pp. 139-155 (undated) [13 ref. En] [Health Protection Branch, Dep. of National Health & Welfare, Ottawa, Canada]

Role of the Canadian Food & Drugs Act in improving safety of the food supply is discussed, with particular reference to the intention of the Department of National Health & Welfare to introduce a regulation under the Act prohibiting sale of salmonella-contaminated poultry meat. Previous experience suggests that food safety is improved only by enforcement of regulations for specific foods. Data on levels of contamination of poultry products in Canada and elsewhere are presented, and it is estimated that 1/3 of the lots of poultry meat on sale in Canada would comply with the new regulations. Salmonella serotypes isolated from poultry show that these are important in human infections; annual cost of human infections to Canada is estimated at $25 \times 10^6 - 100 \times 10^6$. DIH

27

Extrusion and texturizing in the manufacture of poultry products. [Review]

Maurer, A. J.

Food Technology 33 (4) 48-51 (1979) [40 ref. En] [Dep. of Poultry Sci., Univ. of Wisconsin, Madison, Wisconsin 53706, USA]

Mechanical deboning of poultry yields a very fine meat puree lacking texture and shape. Such mechanically deboned poultry meat (MDPM) may readily be incorporated into emulsion-type products (e.g. bologna, frankfurters), but recent attention has been focussed on the possibility of extruding MDPM or of mixing it with texturized soy protein to give a product having shape and form. This review explores this possibility, consideration being given to: types of extruder; acceptability of poultry products containing soy protein; manufacture and properties of various soy-

poultry products (e.g. chicken loaves and sausages); extrusion of ground and comminuted poultry meat to provide textured products, and properties of such products; acceptability of textured poultry meat; and recently developed extrusion/texturization processes (e.g. particulate binding of tissue, freeze texturization, browning or pan-frying of MDPM). JA

28

Control of salmonella in processing. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38]) [Lecture]

Dubbert, W. H.

pp. 117-121 (undated) [En] USDA, Washington, DC, USA]

Role of the USDA in reduction of incidence of salmonellae in meat and poultry products is briefly described. Points covered include development of inspection policies appropriate to producers of ready to eat and convenience meat products, and development of microbiological quality control programmes by producers, which are submitted to the USDA and then monitored. Procedures adopted by producers to reduce contamination include in-plant chlorination, use of automatic poultry eviscerators, proper training of operatives, and use of automated cleaning equipment. USDA is cooperating with the FDA to develop an ordinance covering retail food store sanitation. DIH

29

['Sausage steaks' from goose meat.]

Skrabka-Blotnicka, T.; Grudzinska, E.; Lesiow, T.

Przemysł Spożywczy 33 (6) 227-229 (1979) [5 ref. Pl]

[Inst. Tech. Przemysłu Chem. i Spożywczego Akademii Ekonomicznej, Wrocław, Poland]

Effects of substituting 15% soy protein or 15 or 20% sodium caseinate for meat in the production of goose products ('sausage steaks' incorporating 25 or 30% of the meat in minced form) were studied. Analyses covered rheological properties, yield (meat, skin), aerobic and enterococci counts, sensory characteristics, and contents of water, protein, fat, nitrates, nitrites and salt. Best results were obtained with incorporation of 33% minced meat; no significant differences between meat-substituted (all levels) and control (all-meat) steaks were observed. Yield was reduced with increasing degree of fat removal from the skins of the geese (used as casing). HBr

30

Processing of poultry products with and without sodium nitrite.

Bauermann, J. F.

Food Technology 33 (7) 42-43 (1979) [En] [Horace W. Longacre, Inc., Box 8, Franconia, Pennsylvania 18924, USA]

Some types of poultry products, processed with or without nitrite to give longer shelf-life than raw meat, and the processes involved are discussed. Use of citric acid as pH control with or without HTST treatment gives a product with a shelf life of 10-16 wk at $<4.4^{\circ}\text{C}$. 'Thermoplastic' products are mixtures of cooked ingredients and binders stuffed into casings and pasteurized; products are sold sliced and vacuum-

packed with shelf lives of approx. 6 wk at $<4.4^{\circ}\text{C}$. 'Thermoset' products include items such as roasted turkey rolls and boneless cooked breasts, and are sold in bulk vacuum packaging, often frozen. Smoked, cured nitrite-containing products are made with 136-156 μg sodium nitrite/g product, and include items such as poultry frankfurters. Combination poultry/red meat products exist in which only the other meat (e.g. bacon) contains nitrite. Sensory analysis results of nitrated vs. non-nitrated products are inconclusive, but nitrite does provide improved shelf-life. Use of sorbic acid as an alternative to nitrite has produced less acceptable flavour in products. DIH

31

Poultry processing.

Munchmeyer & Co.

UK Patent Application 2 007 080A (1979) [En]

Apparatus is described for opening and cleaning the stomachs of chicken and the like, which employs a rotary carrier wheel with pockets and in which the stomach is carried across the edge of a blade. IFT

32

Food hygiene and food inspection - the legislation and the impact of the EEC.

Jacob, M.

Royal Society of Health Journal 98 (2) 58-60 (1978)

[En] [Dep. of Health & Social Security, London, UK]

The author points out some of the difficulties in adjusting United Kingdom legislation, relating to food hygiene, to that of the EEC whose procedure for producing legislation is on a vertical (food commodity) basis, whereas that in the UK tends to be on a horizontal basis. In this connection, EEC Directives relating to poultry processing hygiene and microbiological standards for certain foods are dealt with in some detail. EJM

33

Effects of smoke processing on muscle food product characteristics. [Lecture]

Sink, J. D.

Food Technology 33 (5) 72, 74, 78, 80, 83 (1979) [13 ref. En] [Meat Lab., Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

A review is made of effects of various smoking processes on sensory quality, composition and storage characteristics of foods made from meat, fish and poultry. Extensive tabulated data show effects of smoke processing on preference, shear values, individual palatability characteristics, chemical composition of frankfurters, protein composition and amino acid content of pork muscle. Types of process covered include aerosol solid or liquid smoke, and dips or mixes of liquid smoke. [See also preceding 3 abstr.] DIH

34

The effect of lactic acid bacteria on some properties of mechanically deboned poultry meat.

Raccach, M.; Baker, R. C.

Poultry Science 58 (1) 144-147 (1979) [15 ref. En]

[Poultry Sci. Dep., Cornell Univ., Ithaca, New York 14853, USA]

A 50:50 mixture of meat lactic acid starter cultures (*Pediococcus cerevisiae* and *Lactobacillus plantarum*) was inoculated (2×10^9 cells/g) into mechanically deboned poultry meat (MDPM). The MDPM was stored at 3°C for 7 days. The thiobarbituric acid (TBA) test, the emulsifying and water-holding capacities, and colour were examined. At the end of the storage period, the MDPM samples treated with the meat starter cultures had lower TBA values than the untreated sample (4.6 vs. 5.4, resp.). The meat starter cultures did not affect the meat protein as both the emulsifying and water-holding capacities were similar to the control. No deterioration of the red colour of the MDPM was noticed during the whole storage period. The lactic acid meat starter cultures inhibited the growth of the MDPM psychrotrophic bacterial population by 100 fold, keeping it below spoilage level (10^7 cells/g). AS

35

Factors influencing poultry meat flavour.

Pandey, N. K.; Singh, R. P.

Poultry Guide 16 (5) 39-41 (1979) [En] [Div. of Poultry Res., Indian Vet. Res. Inst., Izatnagar, Uttar Pradesh, India]

Factors considered include: breed and nutrition, manner of killing, bleeding, dry plucking or scalding, evisceration, refrigeration and freezing. CFTRI

36

Detection of tylosine residues in poultry meat.

Karkocha, I.

Roczniki Panstwowego Zakladu Higieny 30 (3) 273-276 (1979) [2 ref. Pl, en] [Zaklad Badania Zywnosci i Przedmiotow Uzytku Panstwowego Zakladu Higieny, Warsaw, Poland]

Minced samples of meat were extracted with phosphate-citrate buffer at pH 5. The extract was deproteinized with 5% solution of zinc sulphate and saturated solution of barium hydroxide. After centrifugation, the liquid phase was alkalized to pH 9 and extracted with a mixture of chloroform and ethyl acetate (2:1). Organic extracts were evaporated in a water bath at temp. not exceeding 58°C. Residues were dissolved in ethanol. The ethanol solution was spread on a chromatographic slide coated with silica gel F₂₅₄ Merck, according to Stahl. The chromatogram was developed bidirectionally in successive solvent systems: chloroform + acetone (60 + 40); ethyl acetate + methanol (85 + 15). Antibiotic spots were developed by sprinkling the slides with 15% solution of *o*-phosphoric acid in alcohol. The method make possible detection of 0.1 mg tylosine in 1 kg meat. AS

37

The effect of zinc on the assimilation of beta-carotene in poultry.

Honory, K.

Bulletin of the Veterinary Institute in Pulawy 22 (3/4) 77-80 (1978) [8 ref. En] [Dep. of Biochem., Vet. Inst., Pulawy, Poland]

55 Leghorn hens (age 18 months) were fed for 4 wk a diet lacking synthetic vitamin A and Zn. The hens were then randomly divided into 2 groups. Both groups were fed for 18 days the above diet supplemented daily with 0.908 mg β -carotene/hen; one of the groups also received daily 24 mg ZnSO₄·7H₂O/hen. The hens were then sacrificed. The blood and liver were analysed for vitamin A and carotenoids, while the serum, liver, lung, kidney, spleen, heart, pancreas, small intestine and caecum were analysed for Zn. Results are tabulated. Analysis for vitamin A after the initial 4 wk feeding period indicated a considerable vitamin A deficiency in the liver but a relatively high content in the serum. Comparison of the results for the 2 groups of hens indicated that on adding Zn to the diet the conversion of β -carotene to Vitamin A is increased, leading to accumulation of vitamin A in the liver. JA

38

[Use of poultry meat for sausage manufacture.]

Choroszucho, A.

Gospodarka Miesna 30 (11) 21-22 (1978) [Pl]

A brief, general survey of the use of poultry meat for sausage manufacture is given. Sausages made with medium-ground poultry meat up to 40% of the total raw materials have been found to give satisfactory organoleptic properties. Broiler meat is particularly suited for production of dietetic sausages. HBr

39

Energy requirements for processing poultry.

Whitehead, W. K.; Shupe, W. L.

Transactions of the ASAE 22 (4) 889-893 (1979) [3 ref. En] [USDA-SEA-AR, Athens, Georgia, USA]

An energy survey of 3 poultry processing plants, handling 8000, 13 500 and 12 500 birds/h and consuming 252.05, 256.67 and 186.47 kWh/1000 head resp. showed that the largest electricity consumption was for process refrigeration (i.e. 119.08, 88.33 and 96.06 kWh/1000 birds, or 47.2, 34.4 and 51.5% of total). Monthly variations in energy consumption showed the highest electricity requirements for refrigeration in the summer. Natural gas and fuel oil were the primary sources of fossil fuel for heat and steam. RM

40

Containers for poultry meat.

Taneja, B. S.; Winter, A. R.

Poultry Guide 16 (4) 33-39 (1979) [13 ref. En] [Punjab Agric. Univ., Ludhiana, Punjab, India]

Poultry meat stored in lacquered cans possesses better appearance than those stored in plain cans. Glass jars (which are cheaper and transparent) can also be used for packaging of poultry meat, provided the lids are air-tight. CFTRI

41

[When the conveyor chain should be adapted to the production rate.]

Anon.

Imballaggio 30 (283) 122-123, 141 (1979) [It]

An illustrated description is given of a poultry processing plant capable of handling up to 50 000

birds/day (from slaughtering to freezing). A feature of the plant is an infinitely variable-speed transport system which enables the conveyor belts and chains to be regulated automatically to conform with the production rate. HBr

42

[Poultry meat. Technological requirements for butchering and preparing the meat.]
Bulgaria, D'rzhaven Komitet za Standardizatsiya
Bulgarian Standard BDS 14592-78, 7pp. (1978) [Bg]

43

[Wooden boxes for meat, dairy and poultry products.]
Union of Soviet Socialist Republics, Gosudarstvennyi
Komitet SSSR po Standartam
Soviet Standard GOST 13361-78, 6pp. (1978) [Ru]
[Moscow, USSR]

This standard, which replaces GOST 13361-67, gives the dimensions and technical requirements for 24 types of non-dismantlable boxes ranging in capacity from 8.2 to 114.2 dm³. The moisture content of the wood used must not exceed 20% (or 18% in the case of boxes for butter, which must be made of spruce, fir, cedar, beech, lime or aspen). Mould on the wood is not permitted, but superficial worm holes and resinous pockets are permitted on the outer layers of the wood in boxes for butter and cheese. The boxes must be clean and free from any extraneous odours affecting product quality. Appendix 1 to the standard lists the particular products (butter, different varieties of cheese, eggs, meat, etc.) that are recommended for each type of box; and Appendix 2 indicates in detail how eggs and different varieties of hard rennet cheese should be arranged in the appropriate boxes, e.g. Uglich cheeses should be arranged in 2 rows of 5 in Box No. 6 (480 x 285 x 295 mm), with 4 transverse partitions and 1 longitudinal partition of specified dimensions. ADL

44

Incidence of Salmonella in pork and poultry products.

Duitschaever, C. L.; Buteau, C.
Journal of Food Protection 42 (8) 662-663 (1979)
[14 ref. En] [Dep. of Food Sci., Univ. of Guelph, Guelph, Ontario, N1G 2W1 Canada]

223 retail samples of pork and poultry products were purchased in the Toronto area and analysed for salmonella contamination. Procedure used was lactose pre-enrichment incubation at 41°C, enrichment incubation in tetrathionate-novobiocin or selenite-cystine broth followed by plating onto salmonella-shigella, bismuth/sulphite or xylose/lactose/desoxycholate agar. Suspect colonies were transferred to triple sugar/Fe or lysine/Fe/agar slants or malonate broth and further identified using the API microscreening system. Confirmation was by serotyping. 36 of the 223 samples (16.14%) contained *Salmonella* sp.; for individual products results were: pork sausages 15 of 105 contained salmonellae; turkey sausages 3 of 3; ground pork 5 of 25; pork chops 7 of 50; chicken parts 5 of 7; and barbecued back pork 1 of 33.

A total of 37 isolates was obtained (1 pork sausage contained 2 spp.) which were classified into 10 serotypes; *Salmonella agona* (11 of 37) and *S. typhimurium* (8 of 37) predominated. Occurrence of *S. agona* in ready-to-eat barbecued pork indicates need for legislation on retail storage temp. of this product. DIH

45

Levels of chlorine and chlorine dioxide of equivalent bactericidal effect in poultry processing water.
Lillard, H. S.

Journal of Food Science 44 (6) 1594-1597 (1979) [En]
[USDA Richard B. Russell Agric. Res. Cent., SEA-AR, PO Box 5677, Athens, Georgia 30604, USA]

Equivalent levels of Cl₂ and ClO₂ (generated on-site) were established on the basis of bactericidal action in bird chiller water. When introduced directly into the chiller water after processed birds had begun to enter the chiller, 5 p.p.m. ClO₂ and 34 p.p.m. Cl₂ were equally bactericidal. When introduced into the chiller with the fresh-water input, 20 p.p.m. Cl₂ and 3 p.p.m. ClO₂ were equally effective. Use of about 1/7 as much ClO₂ as Cl₂ would be less corrosive to processing equipment and provide the poultry industry with an alternative bactericide to Cl₂. IFT

46

[Growth and carcass composition of male and female Pekin ducks fattened for different periods.] Mast- und Ausschlachtungsleistung von männlichen und weiblichen Pekingenten bei unterschiedlicher Mastdauer.

Torges, H.-G.; Wegner, R.-M.
Archiv für Geflügelkunde 43 (3) 112-117 (1979) [6 ref. De, en, fr, ru] [Inst. für Kleintierzucht Celle, Bundesforschungsanstalt für Landwirtschaft, Braunschweig-Völkenrode, Federal Republic of Germany]

Groups of male and female Pekin ducks (1 day of age at the start of the trial) were used in a study on effects of duration of fattening (52, 59 or 66 days) on performance and carcass quality. Tables of results are given, including data for carcass yield, wt. and % yield of breast, thigh, the remainder of the carcass, and abdominal fat; skin, bone and meat contents of the breast and thigh cuts; moisture, crude protein and crude fat contents of the thigh muscle, and crude fat content of the skin. Ready-to-cook carcass wt. was higher for females than for males for the 2 shorter fattening periods; there was no significant sex difference for the longest fattening period, as no further increase in carcass wt. of females occurred during the final wk of fattening. % breast meat increased but % thigh meat decreased with increasing fattening time. Abdominal fat wt. and % and the crude fat content of the thigh muscle varied little with duration of fattening. AJDW

47

[Alpha-tocopherol content in mitochondrial fraction isolated from fowl and porcine skeletal muscles.]

Yamauchi, K.; Chinen, K.; Ohashi, T.
Journal of the Japanese Society of Food and

Nutrition [Eiyo to Shokuryo] 31 (1) 102-104 (1978)
[10 ref. Ja, en][Dep. of Anim. Sci., Miyazaki Univ.,
Miyazaki, Japan]

Red muscle is known to contain higher amounts of α -tocopherol than white muscle; the nature of this difference was further studied by determining α -tocopherol levels in the mitochondrial fractions prepared from fowl and swine white and red muscles. Tissues investigated were *M. pectoralis profundis* and thigh muscle in fowl, and *M. longissimus dorsi* and *M. biceps femoris* in swine. Mitochondrial fractions from red and white muscle in fowl contained 0.175 and 0.113 μmol α -tocopherol/g protein, resp.; corresponding figures for swine were 0.148 and 0.080 μmol /g. Contents in red muscle mitochondria were significantly higher than in those from white muscle. Swine red muscle also contained more mitochondria than white muscle. [From En summ.] DIH

48

Studies on curing and smoking poultry meat.
Moorjani, M. N.; Raja, K. C. M.; Puttarajappa, P.;
Khabade, V. S.; Mahendrakar, N. S.; Mahadevaswamy,
M.

Indian Journal of Poultry Science 13 (1) 52-57 (1978)
[10 ref. En][Cent. Food Tech. Res. Inst., Mysore-
570 013, India]

Conditions were standardized for the production of smoke-cured poultry by 3 methods: injection and curing; injection and pickle curing; and pickle curing. The products were evaluated for tenderness, juiciness, colour, flavour, saltiness, rancidity, and microbiological quality. Pickle cured poultry had the longest shelf-life, because of uniform distribution of salt within the muscle. The moisture content of smoke-cured poultry packaged in polythylene or Cryovac bags and stored in wire-mesh boxes was 55.58%, the NaCl content was 5%. The product could be stored for 6-7 days at approx. 30°C and 60-95% RH. Smoke-cured poultry coated with an ethylene glycol-gelatin film could be kept a room temp. without much surface dehydration. CFTRI

49

Poultry processing.
Meyn, P.

British Patent 1 550 501 (1979)[En]

Apparatus is described for splitting, cleaning and skinning poultry gizzards which employs pressure discs to hold the gizzards against rollers for removal of the linings. IFT

50

[Refrigeration and the bacteriological quality of poultry.]

Lahellec, C.

Revue Generale du Froid 70 (9) 485-490 (1979)[Fr]
[Sta. Exp. d'Aviculture, 22440 Ploufragan, France]

This paper discusses factors affecting the bacterial contamination of carcasses along a poultry slaughtering line, with special reference to refrigeration methods and storage. Data are presented from various plants and from air- and water-cooling, concerning the development of the total and psychrotrophic

microflora. It is concluded that the microflora is affected by all the operations prior to cooling. No cooling method is condemned, provided the sanitary conditions are satisfactory. RM

51

Improvements in or relating to apparatus for cutting out the vent of a fowl.

Meyn, P.

British Patent 1 550 591 (1979)[En]

The apparatus is comprised of a cutting means with a hollow cylindrical knife concentrically rotating about a centre pin which is arranged to be inserted into the vent opening of the fowl in order to centre the vent relative to the knife. The knife is carried by the free end of a hollow driving shaft. The knife can be rotated in the opposite direction of the centre pin. The apparatus cooperates with an overhead conveyor with shackles for hanging the birds to be processed. SP

52

Improvements in or relating to apparatus for cutting out the vent of a fowl.

Meyn, P.

British Patent 1 550 592 (1979)[En]

See preceding abstr.

53

[Poultry meat. Method of histological analysis.]

Union of Soviet Socialist Republics, Gosudarstvennyi
Komitet SSSR po Standartam

Soviet Standard GOST 23481-79, 6pp. (1979)[Ru]

The method involves use of a freeze microtome and a biological microscope (magnification up to 90 \times) for analysis of prepared dyed samples. Characteristics of 'fresh', 'doubtful' and 'not fresh' samples are tabulated. HBr

54

[Poultry meat inspection.] Die Untersuchung von
Geflügelfleisch.

David, H.

Schlachten und Vermarkten 79 (8) 238-240 (1979)

[De][Min. für Ernährung, Landwirtschaft & Forsten des
Landes Nordrhein-Westfalen, Rosstrasse 135, 4000
Düsseldorf 30, Federal Republic of Germany]

Inspection of poultry meat in the Federal Republic of Germany (effective from 15th Aug. 1979 and conforming to EEC guideline of 10th July 1975) is outlined. It consists of 3 partial inspections, i.e. inspection of the poultry intended for slaughter, inspection for transport damage and inspection of the meat. The evaluation, labelling, personnel requirements, calculation of fees, and transitional arrangements for meat obtained prior to the key date are briefly discussed. RM

55

[Labelling requirements of the poultry meat hygiene regulations.] Die Kennzeichnungsvorschriften des
Geflügelfleischhygienerechts.

Gessler, M.

Schlachten und Vermarkten 79 (9) 270-273 (1979)

[7 ref. De] [Nussbaumerstrasse 30, 5000 Cologne 30, Federal Republic of Germany]

The provisions of the Federal German poultry meat hygiene regulations are tabulated and discussed as follows: meat hygiene laws; admission of slaughtering, cutting, freezing and chilling, processing (for export) plants; official inspection, evaluation and labelling; exceptions – farm sales, easing of conditions for small farmers, cutting and storage in retail trade, restaurants and communal feeding; labelling – fresh carcasses (wrapped or unwrapped), portions, collective packs; prepared meat – single and collective packs information on official labels – origin of fresh or prepared poultry meat (EEC including Federal Republic of Germany, third countries, German Democratic Republic – if applicable imported but cut in the Federal Republic of Germany). Some labels are illustrated. RM

56

Delocalization of mitochondrial enzymes during freezing and thawing of skeletal muscle. (In *'Proteins at low temperatures'* [see FSTA (1980) 12 5A275])

[Lecture]

Hamm, R.

Advances in Chemistry Series 180, 191–204 (1979)

[49 ref. En] [German Fed. Inst. of Meat Res., Kulmbach, Federal Republic of Germany]

The influences of freezing and thawing of bovine and porcine skeletal muscles on the subcellular distribution of the mitochondrial enzymes aconitase (AC), fumarase (FU), malate dehydrogenase (MDH), succinic dehydrogenase (SDH), glutamic dehydrogenase (GDH), glutamic pyruvic transaminase (GPT), and the mitochondrial isozyme of the glutamic oxaloacetic transaminase (GOT_M) were investigated. Freezing at -5°C had only a slight effect but between -10° and -60°C the release of AC, FU, MDH, GDH, GPT, and GOT_M from mitochondria into the sarcoplasm increased with decreasing temp., apparently because of increased damage to the mitochondria. SDH was not released. The rate of freezing (between 0.1° and $7^{\circ}/\text{min}$) had little effect on the release of enzymes. It is suggested that mitochondrial damage is caused mainly by dehydration during ice formation. Release of GOT_M can be reliably used to distinguish between fresh and frozen-thawed red meats, poultry, and carp. AS

57

Gas chromatography of phenols as acetates: an improved method and its application to methiocarb, pentachlorophenol, and 5,7-dichloro-8-quinolinol at residue levels.

Love, J. L.; McGrath, H. J. W.; Winchester, R. V. *New Zealand Journal of Science* 22 (3) 249–252 (1979) [5 ref. En] [Chem. Div., DSIR, Petone, New Zealand]

Phenols at residue levels are converted to their acetates (which can be determined by gas chromatography) by reaction with acetic anhydride in cold aqueous alkaline solution. The reaction is rapid, and interferences are minimal. Detn. of methiocarb in fruit and cereals, pentachlorophenol in water and fish, and 5,7-dichloro-8-quinolinol in poultry meat are described. AS

58

The relative sensitivity to *Limulus* amoebocyte lysate (LAL) of meat-borne psychrotrophic gram negative bacteria.

Shereda, A. L.; Jay, J. M.

Abstracts of the Annual Meeting of the American Society for Microbiology 79, 212 (1979) [En] [Wayne State Univ., Detroit, Michigan 48202, USA]

The LAL test is the most sensitive method known for detecting endotoxins. While all Gram negative bacteria tested in this as well as other laboratories have been found to be LAL positive, reports on the relative sensitivity of psychrotrophic bacteria to LAL are wanting. In this study, 16 strains of psychrotrophic bacteria isolated from fresh and spoiled beef, poultry and oysters were grown on pyrogen-free BHI slants at 30°C for 18 h. Following plate counts on PCA, LAL titres were determined on serial dilutions of homogenates in pyrogen-free water using LAL reagents from 2 commercial sources. The endotoxin content of the strains was calculated by employing the sensitivity of LAL preparations determined by doubling dilutions of certified endotoxin standards. The ng endotoxin/ 10^3 cells ranged from 1×10^{-4} to 24×10^{-2} with a mean of 6.2×10^{-3} . Mean ng/ 10^3 cells of 3 meat-borne mesophiles was 1.5×10^{-2} . In spite of the low temp. at which fresh meats are kept and the existence of pH values as low as 5.6 in some products, LAL-determined endotoxin values can be used to estimate total Gram negative psychrotrophs in these products in 1 h. This can be achieved by dividing total ng endotoxin/g of meat (determined by LAL) by mean value above. AS

59

[Factors causing unfavourable meat appearance.]

Takacs, I.; Takacs, J.

Magyar Allatorvosok Lapja 33 (7) 470–473 (1978)

[28 ref. Hu] [Allatorvostudományi Egyetem

Elélmiszerhigiéniai Tanszéke, Budapest, Hungary]

Good quality meat has high ATP and glycogen concn., low lactic acid concn., and low pH. The 2 most common, unfavourable conditions in meat are the 'pale, soft, exudative' (PSE) and the 'dark, firm, dry' (DFD) defects. PSE is observed mainly in pork, and, to a lesser extent, in poultry and beef. It is caused by fast decrease of pH values after slaughter, which leads to the denaturation of muscle protein, because of the accumulation of lactic acid and the fast decomposition of ATP. DFD, which is observed both in pork and beef (dark cutting) is caused by accelerated glycolysis resulting in high pH (> 6.2), which is favourable to increased microbial activity, affecting the keeping quality of the meat. Both PSE and DFD are due to certain stress factors which act on sensitive animals before and during slaughter. There are certain breeds which are especially sensitive to stress. Stress may be caused by inadequate feeding (e.g. lack of vitamins and essential trace elements), bad housing, transport under unfavourable conditions, bad preslaughter conditions (e.g. overcrowding), and wrong slaughter technology. ESK

60

[Sound nutrition with poultry.] Gesunde Ernährung mit Geflügel.
Anon.

GV-Praxis mit Tiefkühlpraxis 19 (2) 52, 54 (1979) [De]

Use of poultry and poultry products in catering is briefly discussed, with reference to their relatively high protein content and low fat content, and their consequent suitability for replacement of other meats in low-fat and low-calorie diets for hospital patients etc. A block diagram is given showing the protein and fat contents of 8 types of poultry meat-based sausages etc. (mainly turkey-based products). The value of poultry products as a source of dietary vitamins, minerals and polyunsaturated fatty acids is also briefly considered. AJDW

61

[Effects of energy level and pelleting of the diet on growth and fattening performance of guinea fowl as compared with chickens.]

Blum, J.-C.; Leclercq, B.

Annales de Zootechnie 28 (3) 261-269 (1979) [8 ref. Fr, en] [Sta. de Recherches Avicoles, INRA, Cent. de Tours-Nouzilly, 37380 Monnaie, France]

Groups of chickens and guinea fowl were fattened from 7 to 84 or 98 days of age on diets of 2 energy levels (2900 vs. 3240 kcal metabolizable energy/kg) and 2 physical forms (mash vs. pellets). Tables of data are given for various performance characteristics of guinea fowl and chickens, and for carcass quality characteristics (1% abdominal fat, total lipid wt., fat-free mass) of guinea fowl. Results for birds slaughtered at both ages show the low-energy diet to give significantly lower abdominal fat % and total lipid wt. in the carcass than the high energy diet, and males to be less fat than females. No sex or diet-related effects on fat-free carcass mass were observed. Abdominal fat %, total lipid wt., and fat-free carcass mass were all higher for the birds slaughtered at 98 days than for those slaughtered at 84 days of age. AJDW

62

[Refrigeration during preparation of mechanically separated poultry meat.]

Labie, C.

Revue Generale du Froid 70 (10) 551-556 (1979) [12 ref. Fr] [Ecole Nat. Vet., Toulouse, France]

After an introductory outline of the properties of mechanically separated poultry meat (MSPM), the application of refrigeration at various processing stages is reviewed. The main features of MSPM composition are very high contents of fat, Ca and blood pigments. Bacteriological standards for raw and heat-treated MSPM are reproduced. Refrigeration should be used without break from slaughtering onwards (i.e. immediately after evisceration), throughout cutting, boning, separation, storage, transport and processing. Required temp. at each stage are discussed. RM

63

[Finishing culled breeding geese with rations of varying nutrition levels.]

Hrouz, J.

Acta Universitatis Agriculturae Facultas Agronomica, Brno 25 (2) 149-153 (1977) [9 ref. Cs, en, de, ru] [Katedra Obecné Zootech., a Genetiky Vysoké školy Zemědělské v Brně, Zemědělská 1, 662 65 Brno, CSSR]

The carcass composition and dressing % of culled breeding geese, and the effects of feeding rations of varying N contents (8.2-11.6 %) and energy value 3130-2124 kcal) were studied. Tabulated results showed that higher calorie contents were reflected in greater visceral fat, breast and thigh wt. The wt. of the liver was not affected. RM

64

Poultry processing.

Stork PMT BV

UK Patent Application 2 017 481A (1979) [En]

Apparatus is described for performing a circular cut about the vent of poultry followed by a cut from the vent to the breast and around the entrails. IFT

65

Poultry processing.

Daikin Kogyo Co. Ltd.

UK Patent Application 2 017 887A (1979) [En]

Apparatus is described for chilling poultry carcasses, which employs repeated spraying with water during the chilling process. IFT

66

[Technological and economic constraints in a poultry processing plant.]

David, G.

Revue Generale du Froid 70 (10) 557-559 (1979) [Fr]

This lecture discusses various constraints on poultry processing plants (e.g. the need for regular supplies, importance of good appearance of the carcasses, storage, needs, insufficient market elasticity, low domestic demand for frozen poultry, no official market support or protection but strict control), and the effects of these constraints on organising the supply and diversifying sales. RM

67

Poultry tray.

Capo, J. L. (International Paper Co.)

United States Patent 4 173 655 (1979) [En]

A tray for shipping and displaying dressed poultry is disclosed. The rear end wall of the tray forms an acute angle with the tray bottom and contains an aperture through which the ends of the legs of the poultry are inserted to prevent locking. Sunburst arranged fingers prevent the legs from pulling away from the rear and lock the fowl in place. A tail shield which folds down to cover the ends of the legs prevents the legs from puncturing the plastics overwrap of the tray. SP

68

[New infant feeding products from eggs and poultry meat.]

Gonotskii, V. A.; Korotaeva, M. M.; Krainyaya, V. S.; Kholodov, V. V.; Popik, G. F.

Myasnaya Industriya SSSR No. 9, 22-24 (1979) [Ru] [NPO "Kompleks", USSR]

Process technology for making 3 types of canned baby food (up to 1 yr of age) is described in detail; the types differ in the degree of dispersion of meat fibre. The product is made in a continuous mechanized line. For babies over 10 months of age sheet TU 49 505-78 specifying canned chicken soup (puree), is given. The finished product contains (in %): fat, 5.95; proteins, 6.7; dry residue, 20.6. To extend the range of products for school age children technologies and formulae for 5 types of egg sausages are given. There is also potential utilization of by-products such as stomachs, hearts for child feeding. Data on making these foods, progress in manufacture and consumption, and possible extension of production are discussed. STI

69

[Manufacture of Kochwurst sausages (fresh low-calorie products).] Herstellung von Kochwurst (frische und kalorienarme Ware).

Winter, F. F.

Fleischerei 30 (8) 614-615 (1979) [1 ref. De]

Manufacture of low-calorie Kochwurst sausages is discussed, with reference to: the importance of fat emulsification for the structure, stability and organoleptic properties of the sausages; use of emulsifiers; use of partially-hydrolysed milk protein in low-calorie sausages (as an emulsifying and binding agent); and advantages of use of poultry meat in low-calorie sausages. Recipes are given for 3 types of low-calorie liver sausage. AJDW

70

[Refrigeration of poultry. A new French technique.] Mazoyer, M.; Manuel, C.

Revue Generale du Froid 70 (10) 561-562 (1979) [Fr] [Soc. L'Air Liquide, Paris, France]

A new technique was developed for fast cooling of poultry carcasses, and tested on laboratory and pilot plant scale. It involves introduction of CO₂ snow into the thoracic-abdominal cavity of carcasses in a cooling tunnel. By optimizing various process parameters 70 g CO₂ snow was introduced in 25 s into 1300 g carcasses, placed side by side on spits fixed on a conveyor belt moving slowly through 2 chambers at -25° and -5°C. The total time for passage along the 6 m tunnel was 35-40 min. No difference was observed between air-cooled and CO₂-cooled carcasses with regard to mesophilic and coliform flora; but a significant difference in psychrophilic flora after 6 and 9 days storage when CO₂ cooled carcasses were packed after 1 h temp. stabilization in cold store, but none in CO₂ cooled carcasses packed after 24 h in cold store, with no difference in organoleptic quality. The advantages of the technique and possible scaling-up to industrial use are briefly discussed. RM

71

[Fattening performance, carcass quality, composition of the meat and feed efficiency of Muscovy ducks (*Cairina moschata domestica*) in comparison with young domestic ducks and young geese.] Die Mast- und Schlachtleistung, der Nährstoffgehalt des Fleisches sowie nährstoffökonomische Daten von Moschusenten (*Cairina moschata domestica* L.) im Vergleich zu Jungmastente und Jungmastgans.

Jeroch, H.

Nahrung 23 (9/10) 943-947 (1979) [1 ref. De, en, ru] [Sektion Tierproduktion & Veterinärmed., Karl-Marx-Univ., Leipzig, German Democratic Republic]

Comparative studies on the performance, carcass quality and meat composition of (i) male Muscovy ducks (slaughter wt. 3.1 kg), (ii) female Muscovy ducks (slaughter wt. 1.8 kg), (iii) male domestic ducks (slaughter wt. 3.0 kg), (iv) female domestic ducks (slaughter wt. 2.8 kg) and (v) male + female domestic geese (slaughter wt. 4.0 kg) are described. Tables of data are given for carcass and meat quality characteristics. Mean values for meat composition of (i)-(v) resp. (fresh wt. basis) were: crude protein 17.5, 15.0, 15, 14 and 17%; crude fat 16, 19, 32, 34 and 23%; crude ash 1.0, 1.2, 1.0, 1.2 and 1.1%; and energy 1055, 1156, 1633, 1689, and 1319 kJ/100 g. Mean values for the carcass and carcass components of (i)-(v) resp. (as % live wt.) were: oven-ready carcass 60, 61, 58, 59 and 60; breast meat (without skin) 10, 11, 7.5, 8 and 7; breast skin 2.5, 3.0, 4, 4.5 and 3.5; total meat (without skin) 30, 30, 21, 20 and 26; total skin 12, 14, 19.5, 22, and 17; and abdominal + internal fat 1.3, 1.6, 2.5, 3.0 and 4. The high quality of (i) and (ii) is discussed. It is suggested that increased production of Muscovy ducks for slaughter is desirable. AJDW

72

[Poultry meat processing on continuous equipment.]

Pererabotka myasa ptitsy na potochno-mekhanizirovannykh liniyakh. [Book]

Bulanov, N. A.; Gaevoi, E. V.

190pp. (1979) [12 ref. Ru] Moscow, USSR; Pishchevaya Promyshlennost'. Price 0.70r

A survey of mechanized processing lines used for poultry processing (hens, ducks, geese, turkeys) is presented. Fully mechanized parts of equipment for poultry processing, where individual processes are automated, are described, as well as equipment for processing feathers, fat and wastes. Chapters are: Equipment for poultry processing and evisceration (pp. 5-36); Fully mechanized line for processing hens, turkeys, ducks and broilers (pp. 37-144); Specialized lines for processing water fowl (pp. 145-164); and General lines for poultry processing (pp. 165-190). STI

73

Spinchiller '77/EEC. Immersion chilling of poultry meat.

Dutschke, G.

Fleischwirtschaft 59 (11) 1579-1586, 1589-1592; 1687-1693 (1979) [42 ref. En, de] [Turmfalkenweg 4, 5300 Bonn 1, Federal Republic of Germany]

The discussion on the spinchiller as a source of cross-contamination in poultry slaughtering lines is reviewed in the context of EEC Council Directive 78/50/EED of

13 Dec. 1977 (supplementing Directive 71/118/EEC). Separate sections set out the problem itself and the difficulties in arriving at a solution, including the detailed rules for the use of water for immersion chilling, microbiological surveillance of chilling plants, and future strategies. The discredited term "spinchiller" is replaced by "EEC immersion chilling system". RM

74

[Effect of different feed fats on changes in fatty acid contents of liver phospholipids in ducks.]

Zegarska, Z.; Markiewicz, K.

Zeszyty Naukowe Akademii Rolniczo Technicznej w Olsztynie, Technologia Żywności No. 13, 183-191 (1978) [11 ref. Pl, ru, en] [Inst. Fizyki i Chemii Żywności, AR-T, Olsztyn, Poland]

Groups of Peking ducks received either no fat addition to the ration (control), or from the 2nd to the 7th wk of age additions of 5 or 8% cod-liver oil or 5% tallow; they were slaughtered at 8 wk of age, and livers of 3 ducks from each group were analysed. In a 2nd experiment, groups of Peking ducks received from 8 wk of age a finisher ration with either 6% wheat starch (control), 6% rapeseed oil, or 6% lard; the ducks were slaughtered at 19 wk of age, and livers of 6 from each group were analysed. Liver fat was extracted with a chloroform/methanol 2:1 mixture, phospholipids were separated by TLC, and their fatty acid composition was determined by GLC. Data for proportions of 7 saturated, 4 monounsaturated and 3 polyunsaturated fatty acids are tabulated for each ration variant. Cod-liver oil feeding at 8% caused the greatest changes, characterized by increase in proportion of saturated fatty acids and decrease in that of polyunsaturated; tallow feeding had the opposite effect; addition of lard caused no changes; and addition of rapeseed oil had a significant effect only in lowering the proportion of arachidonic acid. SKK

75

[Organochlorine hydrocarbon content of the fat of domestic birds. VI. Contents of organochlorine pesticides in reserve fat of young fattened geese of various breeds.]

Smoczynski, S.; Markiewicz, K.; Damicz, W.; Puchajda, H.

Zeszyty Naukowe Akademii Rolniczo Technicznej w Olsztynie, Technologia Żywności No. 13, 175-181 (1978) [6 ref. Pl, ru, en] [Inst. Fizyki i Chemii Żywności, AR-T, Olsztyn, Poland]

Geese of different breeds were fattened on the same ration to 24 wk of age; they were then starved for 12 h, slaughtered, and perirenal fat, abdominal fat and neck, dorsal and rump subcutaneous fats were examined by GLC for chlorinated pesticides. Data for DDT, DDE, DDD and α + γ BHC mean contents in each site are tabulated for 6 Suwalska, 14 Pomorska, 10 Italian White, and 14 Zatorska breed geese. No clear trends linking pesticide content with breed or site were found. [See FSTA (1976) 8 7S1207 for part V.] SKK

76

Comparison of media and methods for counting *Clostridium perfringens* in poultry meat and further-processed products.

Adams, B. W.; Mead, G. C.

Journal of Hygiene 84 (1) 151-158 (1980) [21 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

The methods compared were a MPN method involving enrichment in Differential Reinforced Clostridial Medium followed by streaking on Willis and Hobbs medium (used without the addition of milk) and direct plating (DP) using 3 media: Tryptose-Sulphite-Cycloserine agar without egg yolk, Oleandomycin-Polymyxin-Sulphadiazine-Perfringens (OPSP) agar, and a dehydrated version of OPSP agar; all the agar plates were incubated at 37°C for approx. 20 h in an anaerobic jar containing a mixture of H₂ and 10% v/v CO₂. The methods were applied to various reference strains of 5 *Clostridium* spp. (3 strains of *Cl. perfringens*, 2 of *Cl. absonum*, 1 of *Cl. celatum*, 3 of *Cl. paraperfringens*, 2 of *Cl. perenne*), to neck skin samples obtained from chicken carcasses at 3 processing stages (after evisceration and spray-washing, after immersion chilling, after freezing), to frozen chicken products (including 'burgers', 'fingers', 'rissoles', 'sizzles' and sausages) and to chilled chicken and turkey products (including cooked portions, sliced cooked meat and liver pate). For skin samples, the 3 DP media gave similar counts of *Cl. perfringens*, while the MPN method gave consistently lower counts. *Cl. perfringens* counts with the frozen and chilled products were usually < 10/g and the 3 DP media showed similar specificity for this organism. All the media studied supported good growth of the reference strains of *Cl. perfringens* but physiologically similar spp. also grew well and produced colonies identical to those of *Cl. perfringens*, thus indicating the need for confirmatory tests for *Cl. perfringens*. JA

77

[Integrated processing of bones in Poland.]

Krokha, Yu. A.; Boltenkov, I. M.; Faivishevskii, M. L. *Myasnaya Industriya SSSR* No. 10, 37-41 (1979) [Ru] [Ministerstvo Myasnoi i Molochnoi Promyshlennosti USSR, USSR]

Methods of processing of bones for food and technical applications in Poland are described, and data are given for the performance of equipment for removal of meat residues, boning of sub-standard poultry and use of the resulting meat in smoked products, canned products and meat pastes. An integrated process is described, which produces edible fat, meat/fat mass, edible stock and feed flour; yields of these products (% of raw bone wt.) are 6-8, 28-30, 8 and 32-38%, resp. Throughput of the equipment is 700 kg/h; it is operated by 8 workers. Economic aspects of bone processing are discussed. STI

78

Bacterial flora of poultry: changes due to variations in ecological conditions during processing and storage. [Lecture]

Lahellec, C.; Colin, P.

Archiv für Lebensmittelhygiene 30 (3) 95-98 (1979) [4 ref. En, de] [Min. de l'Agric., Sta. Exp. d'Agric., VPG, 22440 Ploufragan, France]

This study was designed to evaluate the psychotropic bacterial flora of live birds, changes in the flora during carcass processing, effect of environmental conditions during processing and storage on shelf life, and metabolic activity of the bacterial associations. Results, shown graphically and in tables, revealed that the flora of live chickens and turkeys consisted predominantly of *Acinetobacter* strains, with smaller amounts of *Flavobacterium* and *Corynebacterium*. Considerable changes in the flora occurred during processing, but no uniform effect could be observed: *Pseudomonas* sp. (not recovered from live birds) were predominant in some cases and absent in others. They may be derived from water, hands, utensils, etc. Changes during storage were dependent on temp. and packaging: in unpackaged pultry the predominant organisms were pseudomonads, irrespective of their initial levels; poultry packaged in polyethylene film was contaminated predominantly by pseudomonads, and in a more O₂-impermeable film (BBI, O₂ permeability 15-20 ml/m² atm) by Enterobacteriaceae. Variations in contamination affected spoilage, as a result of proteolytic and lipolytic activity. [See FSTA (1980) 12 6B45.] RM

79

Further observations on the effect of feeding diets containing avoparcin, bacitracin and sodium arsenilate on the colonization of the alimentary tract of poultry by salmonella organisms.

Smith, H. W.; Tucker, J. F.

Journal of Hygiene 84 (1) 137-150 (1980) [4 ref. En] [Houghton Poultry Res. Sta., Houghton, Huntingdon PE17 2DA, UK]

Previous studies [e.g. FSTA (1978) 10 7S1043] had indicated that diets containing various additives (e.g. growth promoters) facilitated colonization of the alimentary tract of chickens by a nalidixic acid-resistant mutant strain of *Salmonella typhimurium*. This paper reports further studies, involving incorporation of 3 additives (avoparcin, bacitracin and sodium arsenilate at levels of 10, 10 and 250 mg/kg feed, resp.) into 4 poultry feeds (3 commercial feeds and 1 used in the previous studies) and feeding these diets to 4 strains of chicken (Rhode Island Red, White Leghorn, Light Sussex and a commercial broiler hybrid) and 1 of turkey (a commercial hybrid) kept on wire-netting or littered floors and exposed to infection with 5 nalidixic acid-resistant *Salmonella* serotypes (*Salm. heidelberg*, *Salm. oranienburg*, *Salm. infantis*, *Salm. senftenberg* and *Salm. typhimurium*) and a nalidixic acid-sensitive form of *Salm. typhimurium*. The diets were fed continuously, from the time of hatching, usually for 50 days (the age at which broiler chickens are usually slaughtered). Results indicated that colonization of the alimentary tract by *Salmonella* spp. is strongly promoted by avoparcin, only slightly favoured or unaffected by bacitracin and usually hindered by sodium arsenilate. JA

80

[Rational utilization of raw material in making semi-manufactured and finished foods from poultry meat.] Gonotskii, V. A.; Popkov, V. N.

Myasnaya Industriya SSSR No. 10, 27-30 (1979) [Ru] [Nauchno-proizvodstvennoe Ob"edinenie Ptitsepererabatyvayushchei i Kleezhelatinovoi Promyshlennosti "Kompleks", USSR]

A process and a continuous mechanized production line (throughput 400 kg/h) were developed for production of semi-manufactured poultry products. A schematic flow diagram of the production line is given. Manufacture of a range a semi- and fully-manufactured poultry products is discussed, with special reference to processing methods, economic aspects, rational utilization of the raw material, mechanization, and organoleptic properties of the products. Problems with re-use of waste materials and processing of sub-standard meat are also discussed. STI

81

[Extraneous water contents of poultry products.]

Denes, A.

Baromfitenyesztes es Feldolgozas 26 (1) 27-38 (1979) [11 ref. Hu] [Baromfifeldolgozo Vallalatok Trösztje, Kutatasi Osztaly, Budapest, Hungary]

Extraneous water contents were determined during various stages of processing in the carcasses of 40 chickens (average initial wt. 1420 g), 20 ducks (average initial wt. 2425 g), and a turkey (very limited information given). After bleeding, the values were 0.97% for chickens and 1.83% for ducks (feathers having taken up 3.67% and 5.7% water, resp.). During mechanical plucking, the extraneous water content was reduced to 0.6% in chickens and 0.9% in ducks (0.6% when paraffin wax was applied). After evisceration and washing the extraneous water contents of the carcasses were 0.74% (1.21%) in chicken and 1.07% (1.43%) in duck (values in parentheses relate to ready-to-cook carcasses). After evisceration and dripping after precooling, the total extraneous water in the ready-to-cook carcass was 3.41% for chicken and 5.83% for duck (5.6% for turkey). After packaging, the water loss was about 0.2%. The fowl sp. examined had no significant effect on the extraneous water content, although a larger body wt. in the same sp. resulted in reduced extraneous water %. It is concluded that drastic reduction in the extraneous water content can be obtained only by improved technological parameters of the immersion precooling process. In this respect, the mode of hanging the carcasses could significantly alter the water content. Furthermore, the longer the processing time (recommended time 20-25 min), the higher is the water uptake. Lower temp. (recommended value 1-4°C) of the processing water and lower ambient temp. may also reduce the water uptake. High water pressure may result in high water uptake. ESK

82

[Selecting optimal conditions for scalding and pluming of poultry.]

Khlebnikov, V. I.; Plyasov, Yu. A.; Makoveev, I. I.

Myasnaya Industriya SSSR No. 10, 41-43 (1979) [4 ref.

Ru][Nauchno-proizvodstvennoe Ob"edinenie Ptitsepererabatyvayushchei i Kleezhelatinovoi Promyshlennosti "Kompleks", USSR]

Problems with combined scalding and defeathering of poultry carcasses are discussed; trials were conducted on Category 2 broilers to optimize processing conditions for this purpose. Variables studied were processing time, hydrostatic pressure of water in the collecting vessel, and processing temp. Tables of results are given. An experimental scalding/defeathering unit was designed and constructed on the basis of data from these trials. STI

83

[Studies on the energy, protein and amino acid requirements of 'Cairina 2000' (*Cairina moschata domestica* L.). II. Effects of amino acid content of the fattening ration on fattening performance and carcass quality.] Untersuchungen zum Energie-, Rohprotein- und Aminosäurenbedarf von 'Cairina 2000' (*Cairina moschata domestica* L.). II. Einfluss des Aminosäuregehaltes der Mastration auf die Mast- und Schlachtleistung.

Schubert, R.; Hennig, A.; Richter, G.

Archiv für Tierernährung 29 (11) 691-696 (1979)

[10 ref. De, en, ru][Sektion Tierproduktion & Veterinärmed., Karl-Marx-Univ. Leipzig, DDR-69, Jena, German Democratic Republic]

A total of 7050 Muscovy ducks was used in a series of studies on effects of supplementation of the diet with lysine and/or methionine (at a level of 3 g amino acid/kg feed) and amino acid deficient diets on performance and carcass quality. The ducks were slaughtered at various ages and live wt. Tables of results are given, including data for % meat and % skin in the live wt. The results show that amino acid-deficient diets gave a lower % meat than diets with normal or supplemented lysine and methionine levels. Amino acid supplementation of the diet gave little advantage over normal amino acid levels. AJDW

84

[Packaging of poultry meat.]

Afanasenkov, N. I.

Myasnaya Industriya SSSR No. 9, 25-27 (1979) [Ru] [NPO "Kompleks", USSR]

Packaging of poultry in polyethylene (PE) and PVC-PVDC copolymer bags, under or free of vacuum, was studied, including effect of atmospheric O₂, environmental air temp. and various contaminants on product quality. Reduction of wt. losses, maintenance of quality and satisfactory hygiene, and control of microorganisms was achieved by wrapping the poultry in a plastics film under vacuum or in a CO₂ atm, with subsequent storage at subzero temp. Poultry in PVC-PVDC bags under vacuum at 0°C may be kept for 8-9 days (vs. 5 days at 2°C). Losses of moisture via freezing and storage for 15 days unwrapped were 2.0-2.5% of product wt.; losses dropped to 0.080-0.090% on packaging in PE bags. STI

85

A direct immunoenzyme method for the detection of *Salmonellae* in foods.

Swaminathan, B.; Ayres, J. C.

Journal of Food Science 45 (2) 352-355, 361 (1980)

[En][Dep. of Foods & Nutr., Purdue Univ., West Lafayette, Indiana 47907, USA]

An immunoenzyme conjugate was prepared by labelling the immunoglobulin G fraction of *Salmonella* polyvalent flagellar antiserum with horseradish peroxidase. The immunoenzyme conjugate, when reacted with pure cultures of bacteria and stained with 3-3'-diaminobenzidine was found to specifically stain the cell wall and flagellae of salmonellae. Cells of salmonellae were stained brown after the immunoenzyme reaction and could be differentiated from unstained organisms under a light microscope at 1000× magnification. The immunoenzyme technique was applied to rapid detection of salmonellae in meats and poultry products and the specificity and sensitivity of the method were compared to those of the fluorescent antibody technique and conventional cultural technique. The immunoenzyme procedure was found to give good correlation with the conventional cultural procedure. Its sensitivity was comparable to that of the fluorescent antibody technique. IFT

86

[Effect of adding extraction meat on the sensory qualities of sausages.]

Uchman, W.; Pyrcz, J.; Pezacki, W.

Gospodarka Miesna 31 (10) 22-25 (1979) [5 ref. Pl]

Various types of sausages made with incorporation of 30-40% extracted (i) poultry meat, 15% (i) + 15% (ii) cattle meat or 30% (ii) were analysed for contents of amino acids, colour, juiciness, taste, consistency and overall sensory evaluation. Results (tabulated) indicated that extracted meat may be used for sausage production, the type of sausage being the major factor influencing the quality of the end product. Extracted (i) was generally better than extracted (ii). HBR

87

[Waxing of water fowl carcasses.]

Mel'nikova, L. V.; Kazakova, L. P.

Myasnaya Industriya SSSR No. 9, 25 (1979) [Ru] [NPO "Kompleks", USSR]

Waxing is used to remove feather residues from poultry carcasses after passage through mechanical defeathering machines. New waxing materials (VMTs-1 and VMTs-2) have been developed to improve throughput of the defeathering line, reduce losses, and reduce waxing costs. These waxing materials permit reduction of wax application time and wax film cooling time. The wax film may be cooled with water at room temp. The wax is applied to the carcass at 84°C; waxing at relatively high temp. improves the quality of the waxed carcass. Use of the new carcass waxing materials is economically advantageous. STI

88

[The composition of chicken or poultry fricassee.]
Zusammensetzung von Hühner- bzw. Geflügelfrikassee.
Lange, H.-J.

Fleischwirtschaft 60 (1) 72-74; 103 (1980) [8 ref. De, en] [Gotlandwinkel 3, 2300 Kiel 1, Federal Republic of Germany]

43 samples of canned chicken or poultry fricassee from 5 manufacturers were analysed. Tabulated results showed meat contents of 22.8-41.8%, mean 34.2%, and only 5 samples with $\geq 40.0\%$ meat (by preparative gravimetric detn. of total meat as % of total contents). A re-examination of the guidelines is suggested, as the specified 40% meat in the finished product does not correspond to general commercial practice. RM

89

Device for modelling poultry.

Apparatenbou Moba BV

British Patent 1 555 414 (1979) [En]

Poultry modelling apparatus employs a set of hinged shells to urge the poultry into the required shape, ensuring enclosure of the wings. IFT

90

Poultry picker.

Harben, G. S., Jr.

United States Patent 4 179 772 (1979) [En]

A method is described for defeathering poultry suspended in a head down position in which they are engaged on opposite sides with sets of resilient picking fingers rotating about axes which are perpendicular to one another. IFT

91

A new procedure for estimation of Nitrovin and Carbadox residues and their metabolites in food of animal origin. [Lecture]

Skarka, P.; Sestakova, I.

Archives of Toxicology Suppl. 1 207-210 (1978) [En] [Res. Centre for Biofactors, Horni Pocernice II., Prague 9, Czechoslovakia]

Polarographic techniques, which are relatively cheap and simple to perform, were developed for monitoring edible tissues of animals for residues of Carbadox and Nitrovin. Carbadox detn. is based on polarographic reduction of the metabolite quinoxaline-2-carboxylic acid, after alkaline hydrolysis of samples (pig meat) followed by extraction into ethyl acetate/citrate buffer/benzene. Polarography is in Britton-Robinson buffer pH 2.2. The technique was used to monitor the safe withdrawal period before slaughter; residue levels decreased to < 1 part/billion 35-40 days after Carbadox administration ceased. An octuple-electron reduction technique was developed for polarographic detn. of Nitrovin in poultry liver. Residues determined reached levels of hundreds of parts/billion after prolonged administration; actual residue levels may be higher because of non-polarographically active metabolites. [See FSTA (1980) 12 7A448.] DIH

92

[Shaping or packaging device.]

Moba Holding Barneveld BV

Netherlands Patent Application 7 713 639 (1979) [NI]

A device for shaping and packaging articles of differing sizes, e.g. poultry, consists of an adjustable container with adaptable elastic parts to control the. 2 possible positions, and to prevent the 2nd position from being engaged if this would damage the article to be packaged. W&Co

93

Device for processing poultry backs.

Soran, R. L. (Beatrice Foods Co.)

United States Patent 4 184 229 (1980) [En]

A device for processing picked and eviscerated poultry backs, each having kidneys, fatty portions on opposite sides and a tail, includes a conveyor, a pair of cutters for trimming the fatty portions of the backs, openings in the slide which register with the kidneys, a control system for applying vacuum to the openings, to remove the kidneys, a conveyor for receiving the backs from the slide and a 2nd cutter to trim the tails. HBr

94

Apparatus for splitting, cleaning and skinning poultry gizzards.

Meyn, P.

United States Patent 4 183 117 (1980) [En]

The apparatus has a transport chain which takes the gizzards past a rotating knife, a spreader bar for folding open the split gizzards, and a rotating brush for removing the contents of the gizzards to a set of peeling rolls for removing the linings. HBr

95

Detection of elements in poultry skin by energy dispersive analysis of X-rays with the scanning electron microscope.

Suderman, D. R.; Cunningham, F. E.

Poultry Science 58 (5) 1224-1227 (1979) [18 ref. En]

[Dep. of Anim. Sci. & Ind., Kansas State Univ., Manhattan, Kansas 66506, USA]

Elemental composition and distribution in poultry skin were measured by energy dispersive X-ray microanalysis through the scanning electron microscope. The top, middle, and bottom layers of fresh broiler skin were analysed for Ca, Cl, Mg, P, K, Na and S. The 2 most abundant elements were Na and S. P and Mg had intermediate concn. The least abundant elements were Ca, Cl and K. Ca, Na and S showed significant distribution differences between skin layers. AS

96

[Weight gain, feed consumption and slaughter yield of 2 strains of Muscovy duck.]

Cavalcini, L. G.; Dell'Orto, V.; Roncoroni, C.

Rivista di Zootecnia e Veterinaria No. 5, 329-340 (1979) [14 ref. It] [Istituto di Zootecnia Generale, Fac. di Med. Vet., Univ. di Milano, Milan, Italy]

600 Muscovy ducks (*Cairina moschata*), including

birds of both sexes, were used in a study on growth rate, feed conversion efficiency and yield of the carcass and carcass components. A table of data is given for the live wt., carcass wt., slaughter yield and the wt. and % breast, thighs, skin + fat, neck + head, wings, feet, liver and gizzard of 77-day-old male and 70-day-old female birds. AJDW

97

Composition and stability of lipids from mechanically processed poultry meats (MPPM).

Jantawat, P. P.

Dissertation Abstracts International, B 40 (4) 1614: Order no. 79-21161, 150pp. (1979) [En] [Michigan State Univ., East Lansing, Michigan 48824, USA]

Studies on lipids of (i) mechanically-deboned chicken meat, (ii) mechanically-deboned turkey meat, (iii) hand-deboned chicken meat, (iv) hand-deboned turkey meat and of the corresponding bone residues and skin are described. Fatty acid compositions of neutral lipids differed little between samples; fatty acid compositions of (i) and (ii) phospholipids resembled those of the corresponding bone or manually-deboned meat more than those of skin phospholipids. Phospholipid fraction concn. of (i) and (ii) were most like those of bone lipids. Cholesterol levels in (i) and (ii) lipids were more similar to those of skin or bone lipids than to those of muscle lipids. It is suggested that the meat fat/bone fat/skin fat ratio is 1:3:6 for (i) and 1:4:5 for (ii). Comparative studies were conducted on (i) and (ii) samples (vacuum packaged, or packaged in N₂ or CO₂) stored for up to 4 months at -18°C. Vacuum packaging and N₂ packaging gave better results (lower TBA values, higher unsaturation ratios) than CO₂ packaging. Vacuum packaging gave lower phospholipid losses than CO₂ or N₂ packaging in (ii) but not in (i). Holding the samples for 72 h at 4°C before freezing increased TBA value, and also increased losses of polyunsaturated fatty acids and total phospholipids. In a further study, effects of O₂ pressure (0, 5, 15, 30 inches Hg) on storage stability of (i) and (ii) and their lipid extracts during storage for up to 3 months at -18°C were studied. For (i), stability of samples packaged in air at 5 in Hg pressure was equal to that of vacuum-packaged samples; for (ii), vacuum-packaging gave better storage stability than packaging in air at 5-30 in Hg pressure. Significant differences between mechanically-deboned poultry meats and their lipid extracts were observed for fat stability characteristics. AJDW

98

Role of nutrition on poultry carcass quality. [Review] Narahari, D.

Poultry Guide 17 (3) 23-26 (1980) [14 ref. En] [Dep. of Poultry Sci., Madras Vet. Coll., Madras, Tamil Nadu, India]

The effects of added fat in the diet of poultry on carcass quality are reviewed, in some detail, together with effects of some minerals (Ca and Mo), vitamin A and carotenoids, and drugs (e.g. coccidiostats). CFTRI

99

[Mechanization of transport of cartons.]

Kartonagentransport wurde mechanisiert. Zöphel, K.-H.

Fleisch 33 (4) 69-71 (1979) [De] [VEB KIM Königswusterhausen, Geflügelschlachtbetrieb, German Democratic Republic]

A new continuous conveyor system for empty cartons, developed as part of a rationalization scheme in a poultry slaughterhouse, is described. Cartons and lids are conveyed to the individual workplaces, at a total throughput of 780/h. A production-line system for erection of the cartons was also developed. Advantages claimed for these developments include increased productivity, reduced space requirements, and reduced costs. IN

100

Storage and spoilage of uneviscerated and 'oven ready' poultry and game birds.

Barnes, E. M.

Nutrition and Food Science No. 61, 9-10 (1979) [En] [Food Res. Inst., Norwich, UK]

Uneviscerated poultry spoil, provided that the gut has not been perforated due to the effects of H₂S produced by the intestinal microflora diffusing into the muscle, producing an unacceptable flavour and 'greening' of the skin. Game birds seem to develop this spoilage less rapidly than domestic poultry: it is thought that this may be due to the influence of dietary factors. Eviscerated carcasses, however, spoil due to the action of the environmental as opposed to the gut microflora, many organisms in which are capable of growing at chill temp. Recommendations are made for storage conditions for both types of poultry. JRR

101

[Method and device for making an incision up to the breast in poultry carcasses.]

Stork PMT BV

Netherlands Patent Application 7 801 712 (1979) [NI]

In a method and device for cutting poultry carcasses without damaging the intestines the knife makes a sideways movement when cutting across the intestine. W&Co

102

[Effect of method of refrigeration on meat quality of poultry carcasses stored in the near-freezing temperature range.] [Lecture]

Bulgakova, L. V.

Proceedings of the European Meeting of Meat Research Workers No. 24, D3:1-D3:6 (1978) [4 ref. Ru, de, en, fr] [Nauchno-Proizvodstvennoe Ob"edinenie Ptitsepercrabatnyvayushchei i Kleezhelatinovoi Promyshlennosti 'Kompleks', Moscow, USSR]

Vacuum-packaged poultry carcasses were (i) refrigerated at -2°C and stored at this temp. for ≤ 25 days, or (ii) refrigerated at -25°C for 2 h to attainment of internal temp. of -2°C, and stored at -2 ± 0.5°C for ≤ 25 days; (iii) carcasses chilled at 0-

2°C and stored at this temp. served as controls. Breast muscles were examined for contents and solubility of sarcoplasm, myofibrils and non-protein components; trypsin digestibility of the protein components; water-binding capacity; and tenderness (plasticity), determined by a pressing method. Mean values with s.e. are tabulated for groups of 3 carcasses examined before refrigeration, or after 1, 5, 10, 20 and 25 days for (i) and (ii) and after 1, 5 and 8 days for (iii). It is concluded that procedure (ii) resulted in decreased solubility and digestibility of muscle proteins, and impaired tenderness and water-binding capacity, the effect being attributed to cold shortening. Procedure (i) is therefore recommended. [See FSTA (1980) 12 8S1280.] SKK

103

[Effect of rotation and of sterilization regimes on physico-chemical changes in canned poultry meat.] [Lecture]

Khlebnikov, V. I.; Kakhov, M. K.; Bobrikova, E. G. *Proceedings of the European Meeting of Meat Research Workers* No. 24, F13:1-F13:6 (1978) [5 ref. Ru, de, en, fr] [Nauchno-Proizvodstvennoe Ob"edinenie Ptitsepererabatyvayushchei & Kleezhelatinovoi Promyshlennosti 'Kompleks', Moscow, USSR]

250-g cans of poultry meat were sterilized in a rotary 'Rotomat-S' autoclave at 15 rev/min at 120°, 125°, 130°, or 135°C after achievement of constant lethal effect ($F = 10$); and changes in contents of total sulphhydryl groups, disulphide groups, H_2S , total N, protein N, and amino N in comparison with untreated meat; and appearance, colour, odour, consistency, taste and juiciness; as well as in-vitro digestibility by proteolytic enzymes of the treatment variants were determined. Duration of sterilization at 135°, 130° and 125°C was reduced by 27.5, 20.0 and 12.5% resp. in comparison with sterilization at 120°C. It is concluded from results tabulated and graphically presented in detail that increase of sterilization temp. to 130-135°C with corresponding decrease in duration reduced hydrolytic and oxidative changes in proteins and increased their digestibility; however, sterilization at 125°C produced the best organoleptic quality. [See FSTA (1980) 12 8S1280.] SKK

104

[Apparatus for hanging, shaping and packaging poultry.]

Moba Holding Barneveld BV

Netherlands Patent Application 7 713 637 (1979) [NI]

An improved hook in the form of a claw for hanging poultry has ≥ 1 flexible finger which can be adjusted to 2 positions according to the size of the bird. W&Co

105

[Apparatus for shaping and packaging poultry.]

Moba Holding Barneveld BV

Netherlands Patent Application 7 713 638 (1979) [NI]

A device for shaping poultry prior to packaging consists of 3 hinged parts forming a basin in the open position and a tube in the closed position and lid parts adjustable to the bird's wing conformation. W&Co

106

Prohibition of all new and replacement equipment and machinery containing liquid polychlorinated biphenyls (PCB's).

United States of America, Food Safety & Quality Service

Federal Register 45 (42, Feb. 29) 13471-13473 (1980) [En] [Washington, DC, USA]

PCB's are highly toxic and persistent in nature. A number of incidents of human food contamination from PCB's have occurred as a result of leakage from industrial equipment. It is therefore proposed to prohibit entry of new or replacement equipment or machinery containing PCB's onto the premises of plants producing meat, poultry and egg products under official inspection. CAS

107

[TLC determination of 6,6'-ethylene-bis(2,2,4-trimethyl)1,2-dihydroquinoline (XAX-M). II. Lard, poultry fat and canned poultry products.]

Dünnschichtchromatographische Bestimmung von 6,6'-Äthylen-bis(2,2,4-trimethyl)1,2-dihydrochinolin (XAX-M). II. Schmalz, Geflügelfett und Geflügelkonserven.

Rödel, I.

Nahrung 23 (5) 569-571 (1979) [De] [Bezirks-Hygiene-Inspektion & -Inst., Berlin]

XAX-M is extracted from the food with n-hexane; the extract is then purified by partition between acetonitrile and hexane, and separated by TLC on silica gel G, using an acetone/benzene/n-heptane (1:1:3) solvent system. XAX-M flecks on the chromatogram are detected by spraying with a 2% solution of $FeCl_3$ in 1N H_2SO_4 ; XAX-M concn. are evaluated by comparison with reference samples. Detection limit is 0.1 μg ; recovery (for 300 μg added XAX-M) is 100% for lard, 90% for poultry fat. [See preceding abstr. for part I.] IN

108

Poultry packaging.

Rochman, Z.

UK Patent Application 2 024 144A (1980) [En]

Apparatus for packaging poultry in plastics bags employs grips to support the birds above the knee joint and to press them into a funnel upon which is mounted an inflated bag. IFT

109

Meat and poultry products. [Review]

Tompkin, R. B.

Special Report, New York State Agricultural Experiment Station No. 31, 6-10 (1979) [13 ref. En] - [Swift & Co. Oakbrook, Illinois, USA]

The effects of storage time, temp., level of initial contamination and type of packaging on the numbers and composition of spoilage flora, and hence on shelf life and acceptability of fresh and processed meat are reviewed. Published data are used to illustrate the reduction in total counts and in counts of most organisms with reduction in storage temp., and the relative increase in counts of pseudomonads during aerobic storage, and in counts of lactobacillus during

anaerobic storage. Vacuum-packaging prevented the growth of yeasts and hence delayed development of off-flavours. RM

110

Processing and utilisation of animal by-products, with special reference to poultry by-products.

Lachhiramani, R. S.

Poultry Guide 17 (1) 29-36 (1980) [En] [Cent. Avian Res. Inst., Izatnagar, Uttar Pradesh, India]

111

Poultry chilling.

Cope Whelon & Co.

British Patent 1 557 886 (1979) [En]

Tank apparatus is described for chilling poultry carcasses which employs an impeller for advancing the carcasses to a succeeding tank. IFT

112

Poultry processing.

Fox, G. M.; Wright, T. H. (US Industries Inc.)

United States Patent 4 184 230 (1980) [En]

Poultry neck cutting, breaking and stretching methods for removing windpipe are described. IFT

113

[Determination of parameters of suspended rail type conveyors for poultry slaughter.] Bestimmung der Parameter von Hängebahnförderern für die Geflügelschlachtung.

Zsigo, L.; Raeuber, H.-J.

Fleisch 34 (1) 12-15 (1980) [De] [Hochschule für Lebensmittelind., Szeged, Hungary]

2 nomograms are given for detn. of the capacity (in terms of total wt., or number of carcasses) of a suspended rail-type conveyor system for poultry carcasses. Other parameters which may be determined include conveying rate, distance between carcasses, wt. of individual carcasses, and daily production time. Use of the nomogram for design and reconstruction of slaughterhouses and for planning of production is briefly described. IN

114

Sorbic acid inhibition of *Clostridium botulinum* in nitrite-free poultry frankfurters.

Huhtanen, C. N.; Feinberg, J.

Journal of Food Science 45 (3) 453-457 (1980) [En] [USDA E. Reg. Res. Cent., SEA-AR, 600 East Mermaid Lane, Philadelphia, Pennsylvania 19118, USA]

Chicken and turkey frankfurter emulsions and ground commercial frankfurters were treated with sorbic acid or potassium sorbate together with several acidulating agents. These were inoculated with 400 spores/g of a mixture of 21 strains of *C. botulinum* (12 of type A, 9 of type B) and canned under vacuum in 208 × 107 Al tab cans. The cans were temp. abused at 30°C. Chicken emulsions with sodium acid pyrophosphate (used for commercial frankfurters) showed can swelling in 2 days;

turkey emulsion cans swelled in 4 days. Mean swell times for chicken and turkey were, resp.: 7 and 15 days with 0.52% potassium sorbate and 13 and 35 days with 0.40% sorbic acid. Acidification of emulsions with H₃PO₄ or glucono-δ-lactone to a pH as low as 5.4 did not increase mean swell times; however, in combination with 0.4% sorbic acid mean swell times were increased over those with sorbic acid alone. Citric acid increased mean swell times in turkey but not in chicken emulsions. For poultry emulsions and poultry frankfurters commercially prepared with 0.2% sorbic acid, acidification with H₃PO₄ to pH 5.7 resulted in appreciable increases in mean swell times; 0.4% sorbic acid without H₃PO₄ was more effective. Indigenous microflora, causing gas production in the cans, were also inhibited by 0.4% sorbic acid and by H₃PO₄-acidified 0.2% sorbic acid. Finished frankfurters generally behaved the same as the emulsions in *C. botulinum* inhibition; however, they gave better protection than the emulsions when both were treated with 0.2% sorbic acid + H₃PO₄. IFT

115

[The V2-FCL/7 machine for plucking poultry carcasses.]

Cetverikov, V. B.; Skodo, L. A.; Litovko, V. I.

Myasnaya Industriya SSSR No. 5, 16-18 (1979) [Ru]

116

Protein nutritional quality of mechanically deboned poultry meat as predicted by the C-PER assay.

Babji, A. S.; Froning, G. W.; Satterlee, L. D.

Journal of Food Science 45 (3) 441-443 (1980) [En] [Anim. Sci. & Food Sci. & Tech. Dep., Univ. of Nebraska, Lincoln, Nebraska 68583, USA]

Mechanically deboned poultry meat (MDPM) from raw broiler backs and necks (MDCM), cooked mechanically deboned chicken meat from fowl carcasses (CMDFM), and raw turkey frames (MDTM) were evaluated for their nutritional composition and quality. Procedures for evaluation included protein efficiency ratio (PER) using rat and computed PER (C-PER) techniques, in vitro and in vivo digestibilities, amino acid composition, and proximate analysis. All 3 types of MDPM showed PER and C-PER values comparable to those for standard casein. MDTM had a higher C-PER and PER which ranged from 2.59 to 2.75 than did MDCM and CMDFM having values which ranged from 2.34 to 2.94. The PER and C-PER values given are based upon the standard protein casein having a PER and C-PER of 2.50. IFT

117

Comparison of the efficacy of three potential poultry preservatives: glutaraldehyde, iodacetamide, and poly (hexamethylenebiguanide hydrochloride).

Islam, M. N.; Islam, N. B.

Journal of Food Processing and Preservation 3 (1) 1-9 (1979) [17 ref. En] [Dep. of Food Sci. & Human Nutr., Univ. of Delaware, Newark, Delaware 19711, USA]

Freshly processed poultry carcasses were dipped in 500 p.p.m. solutions of glutaraldehyde, iodoacetamide,

and poly (hexamethylenebiguanide hydrochloride), or PHMB, for 2 h. They were then drained, packed in polyethylene bags, and held at the storage temp. of 2°C. Total aerobic psychrophile counts and sensory evaluation indicated that the PHMB had the best preservative effect followed by that of iodoacetamide and glutaraldehyde. The shelf-lives of PHMB, iodoacetamide, and glutaraldehyde-treated birds were found to be 27.4, 21.6, and 15.3 days, resp., compared to the 10.7 days shelf-life of water-treated controls. AS

118

Air chilling and shelf life of poultry. [Lecture] Lahellec, C.

Bulletin de l'Institut International du Froid 59 (4) 1194-1195 Abstr. C2-118 (1979) [En, Fr] [Sta. Exp. d'Aviculture, 22440 Ploufragan, France]

Trends in microorganism development during air chilling of poultry are discussed, taking into consideration different parameters (temp., hygrometry, ventilation). In some cases, qualitative as well as quantitative studies are considered and the influence of given ecological conditions on microorganisms during storage is demonstrated. [See FSTA (1980) 12 9G615.] AL

119

The influence of freezing and storage conditions on the quality of poultry flesh. [Lecture]

Koreshkov, V. N.; Gusljannikov [Guslyannikov], V. V. *Bulletin de l'Institut International du Froid* 59 (4) 1196-1197 Abstr. C2-67 (1979) [En, Fr] [Sci. Res. Inst. of the USSR Refrigeration Ind., Moscow, USSR]

Information is given on quality changes taking place in vacuum wrapped (in polymer films) and unpackaged poultry after slow, rapid and ultra-rapid freezing, and after storage at -18°, -30° and -50°C during 30 months. Large differences were noted in some of the organoleptic and physico-chemical properties of poultry flesh subject to slow, rapid and ultra-rapid freezing. Quality changes during storage are more than often determined by storage temp. and duration and the mode of packaging than by the freezing process. The effect of lowering the temp. from -18° to -30°C and -30° to -40°C on the maintenance of product quality was defined. Proposals are given for different storage periods for poultry in relation to temp. type of packaging and the quality level of the product. [See FSTA (1980) 12 9G615.] AS

120

[Semimechanized procedure for cutting of broilers at the VEB KIM Königs Wusterhausen processing plant.] Teilmechanisiertes Verfahren der Zerlegung von Broilern im VEB KIM Königs Wusterhausen. Zöphel, K.-H.

Fleisch 33 (11) 209-211 (1979) [De]

A new procedure for cutting of poultry carcasses based on the use of carcass splitting machines and a specially-developed twin-knife for removal of the legs are described. The carcass is cut into 8 sections by 4 cuts. The bone content of the leg is slightly increased; however, the cooking quality and juice retention are

improved by the muscle being sealed-off by the hip-bone and *ischium*. This procedure permits a throughput of 900-1200 broilers/h, increasing productivity by 130-165%. IN

121

[Comparison of fattening, carcass and organoleptic quality of geese slaughtered at 9 and 16 weeks of age.]

Bielinska, K.; Kaszynski, J.; Bielinski, K.; Wcislo, H.; Jeske, J.; Kolodziej, L.

Roczniki Naukowe Zootechniki 6 (2) 307-319 (1979) [11 ref. Pl, en, ru] [Zootech. Zakład Doswiadczalny Inst. Zootech., Koluda Wielka, Poland]

A total of 146 Italian White geese was used in a study on effects of sex, age at slaughter (9 vs. 16 wk) and finishing diet on performance, carcass quality and meat quality. 2 finishing diets were tested: (i) a complete feed mixture, and (ii) oats + carrots. Geese to be slaughtered at 9 wk of age received (i) or (ii) for the last 3 wk.; geese to be slaughtered at 16 wk of age received (i) or (ii) for the last 4 wk. Tables of data are given for numerous carcass characteristics of the geese, and for flavour, taste, tenderness and juiciness of the roasted and boiled meat. Diet had relatively little effect on carcass quality. Carcass quality of (ii) tended to be higher than that of (i). The variables studied had little effect on the organoleptic properties of the cooked meat. AJDW

122

Abstracts of the XII International Congress of Microbiology held in Munich, 3-8 September 1978. [Conference proceedings]

International Association of Microbiological Societies 222pp. (undated) [En]

This publication contains abstracts of invited lectures, symposia and posters presented at the XII International Congress. The symposia included the following titles: Metabolism of wine associated lactic acid bacteria, by R. E. Kunkee (p. 19). Metabolism of cider bacteria, by J. G. Carr & G. C. Whiting (p. 20). Significance and biology of the lactic acid bacteria of sourdough, by G. Spicher (p. 20). The metabolism of carbohydrates by *Bacillus stearothermophilus* and its significance for the technology of beet sugar production, by H. Klaushofer (p. 20). Bacterial flora of poultry: changes due to variations in ecological conditions during processing and storage, by C. Lahellec (p. 21). Cured meats, by T. A. Roberts (p. 22). Posters presented included the following titles: Vitamin enrichment of wine by Spanish 'flor' yeasts, by M. Pilar Aznar (p. 150). Improved enrichment method for salmonella isolation from foods, by P. Vassiliadis, D. Trichopoulos & J. A. Papadakis (p. 171) [see also FSTA (1979) 11 10S1498]. Metabolic compatibility of lactic acid bacteria and micrococci for manufacturing of dairy products, by B. Stevic, M. Sutic & M. Stojanovic (p. 174). Abstracts of a further 35 papers and posters appear individually in FSTA and are listed in the author index under International Association of Microbiological Societies [Symposium]. DIH

123

The ageing of meat.
Winstanley, M.

Nutrition and Food Science No. 60, 8-10 (1979)
[10 ref. En][Meat Res. Inst., Bristol, UK]

The changes taking place in meat and poultry during ageing are described; proteolytic enzyme activity is largely responsible for the tenderization which occurs when meat is hung. Cathepsins, released from ruptured lysosomes, are mainly responsible for the breakdown of collagen, while the muscle fibres are degraded by a protease called the calcium activated factor. Artificial tenderization by use of papain is also possible, but involves problems related to regulation of the enzyme activity during the time when it is active, i.e. in the early stages of cooking. JRR

124

Interactive growth of *Staphylococcus aureus* strains with a poultry skin microflora in a diffusion apparatus.

Gibbs, P. A.; Patterson, J. T.; Harvey, J.
Journal of Applied Bacteriology 48 (2) 191-205 (1980)
[18 ref. En][Dep. of Agric. for Northern Ireland, Newforge Lane, Belfast BT9 5PX, UK]

The growth of different biotypes of *Staphylococcus aureus* strains isolated from poultry was studied using the NBS Ecologen in which the interacting mixed culture was derived from the microflora of hen skin and separated from the *Staph. aureus* culture by a membrane of 0.4 μ m pore size. Inhibition of growth of the *Staph. aureus* cultures occurred with strains from each biotype. Marked inhibition of growth was always accompanied by the production of large numbers ($> 10^9$ /ml) of plaque forming units (phage). In the mixed culture chamber poultry phage group C strains became the predominant *Staph. aureus* type. The phages produced by the mixed culture showed a wide spectrum of lytic activity for the propagating strains of the human, bovine and poultry phage sets. AS

125

[Studies on selection for breast muscle thickness in ducks.] Untersuchungen über die Selektion auf Brustmuskeldicke bei Enten.

Pingel, H.; Jung, S.

Archiv für Tierzucht 22 (4) 281-286 (1979)[7 ref. De, en, ru][Sektion Tierproduktion & Veterinärmed., Karl-Marx-Univ., Leipzig, German Democratic Republic]

This paper includes data for the breast muscle thickness and live wt. of ducks of a line selected for thick breast muscle for 4 generations, and for an unselected control population. Results show that breast muscle thickness increased from 1.04 to 1.59 cm in the selected line, vs. 0.98 to 1.29 cm in the control line, over a 4-yr period. Live wt. also tended to increase as a result of selection for breast muscle thickness. Heritability estimates for breast muscle thickness are also given.

AJDW

126

[Effect of fattening length and nutrition level on carcass value of goslings.]

Lazar, V.; Spacek, F.; Kriz, L.

Acta Universitatis Agriculturae Facultas Agronomica, Brno 24 (2) 317-323 (1976)[6 ref. Cs, ru, en, de][Katedra Chovu Prasat & Drubeze VSZ, Brno, Czechoslovakia]

Effects of fattening time and diet on carcass value of goslings were investigated in 2 trials, involving 35 and 60 goslings. They were fed 20.1% N, 2620 kcal/kg to 3 or 9 wk of age, and 16.4% N, 2720 kcal/kg to 9 or 16 wk. Analysis of carcass yield at 9 wk and 16 wk showed substantial differences between % of thigh and breast meat at different ages; with longer fattening period, the proportion of thigh meat to ready-to-cook wt. either fell or increased slightly, while the breast meat increased significantly ($P = 0.01$). Higher level of nutrition mainly affected the proportion of breast meat. RM

127

Organochlorine pesticide residues in meat of various species.

Madarena, G.; Dazzi, G.; Campanini, G.; Maggi, E.
Meat Science 4 (2) 157-166 (1980)[14 ref. En][Istituto di Ispezione degli Alimenti, Univ., Parma, Italy]

This paper gives data for concn. of organochlorine pesticide residues (α -, β -, γ - and δ -BHC, total BHC, aldrin, dieldrin, heptachlor, heptachlor epoxide, o,p - and p,p' -DDE, o,p' - and p,p -DDD and o,p' - and p,p' -DDT) in 10 samples each of pork, rabbit meat, horse meat, chicken and turkey, studied over the period Jan.-April 1978. The results show horse meat to have the highest and pork the lowest level of contamination with organochlorine pesticides. γ -BHC, p,p' -DDT and p,p' -DDE predominated. In general, there was no clear relationship between organochlorine pesticide concn. and fat concn. of the meat. AJDW

128

[Effects of age on the meat quality of geese.]

Mikolasek, A.; Pour, M.

Sbornik Vysoke Skoly Zemedelske v Praze, Fakulta Agronomicka, B No. 29, 155-169 (1979)[18 ref. Cs, en, ru][Katedra Chovu Prasat a Drubeze, Vysoka Skola Zemedelska, Prague-Suchdol, Czechoslovakia]

30 Bohemian \times Rhineland crossbred geese (equal numbers of males and females) were used in a study on effects of age at slaughter (9, 12 or 30 wk) on meat and carcass quality; tables of data are given for muscle pH 60 min and 24 h post-mortem, total moisture and loosely-bound moisture contents of the meat, breast muscle colour (determined as reflectance values, using Spekol and Göfo instruments) and carcass wt. There was a tendency for muscle pH (60 min post mortem) to be lower at 12 wk of age than at 9 or 30 wk of age; pH 24 h post mortem did not differ significantly between slaughter ages. Loosely-bound moisture content did not vary significantly with age; total moisture content varied irregularly. Muscle colour darkened and carcass wt. increased with increasing slaughter wt. Sex had little effect on the carcass quality characteristics studied. AJDW

129

Effect of changing dietary tetracycline level on growth rate, carcass quality and tetracycline residues in different tissues of Pekin ducks.

El-Husseiny, O.; Riad, S.; Eissa, A. I.; Morsi, M. K. *Annals of Agricultural Science, Moshtohor* 10, 215-225 (1978) [9 ref. En, ar] [Dep. of Anim. Production, Fac. of Agric., Cairo Univ., Cairo, Egypt]

Supplementation of Pekin ducks' diets with increasing levels of tetracycline (5, 10 and then 30 p.p.m.) caused greater wt. gain and feed efficiency, and decreased feed consumption relative to controls or a constant level of tetracycline. Max. wt. was achieved in 3 months, rather than 4, and an increase in the edible portion of the birds was demonstrated. The removal of tetracycline supplementation 2 wk before slaughter caused a sharp decrease in residual tetracycline in the various carcass components. Levels in breast, thigh and liver of birds fed the increasing-level diet up to 2 wk before slaughter were (mg/100 g): 4.2, 12.2 and 13.3, resp. JRR

130

[Effects of selection for breast muscle thickness on the dietary crude protein requirement of ducks.]

Auswirkungen der Selektion auf hohe Brustmuskeldicke der Enten auf den Rohproteinbedarf. Jung, S.; Pingel, H.; Jeroch, H.

Archiv für Tierzucht 22 (4) 287-297 (1979) [9 ref. De, en, ru] [Sektion Tierproduktion & Veterinärmed., Karl-Marx-Univ., Leipzig, German Democratic Republic]

This paper includes data for carcass quality characteristics (breast muscle thickness, % skin-free breast meat, % breast skin, % thigh, and the protein and fat contents of the breast meat) for groups of ducks either (i) selected for thick breast muscle or (ii) not selected, both lines being fed 2 diets differing in digestible crude protein content by 4.3%. Both male and female birds were used in the experiments. The results show that (i) had thicker breast muscles, and lower fat content of the breast muscle than (ii). The higher-protein diet gave thicker breast muscle, higher % breast muscle, lower % fat and higher % protein in the breast muscle than the lower-protein diet. A significant line/dietary protein level interaction was observed for most characteristics studied. AJDW

131

Composition of foods. Poultry products: raw, processed, prepared.

Posati, L. P.

United States Department of Agriculture, Agriculture Handbook No. 8-5, 330pp. (1979) [8 ref. En] [USDA, SEA, Washington, DC 20402, USA]

This section of the revised Agriculture Handbook No. 8 deals with 304 poultry products, including chicken, duck, goose, guineafowl, pheasant, quail, squab (pigeon) and turkey products; and tabulates data from published and private sources, i.e. proximate composition, minerals, vitamins, lipids (fatty acids, cholesterol, phytosterols), and amino acids. It includes appendices on common and scientific names, yields of cooked poultry products, conversion factors for fatty

acids in poultry products, retention of nutrients in cooked poultry products, fatty acid contents of poultry fats, and a guide to poultry products. RM

132

[Method for preparation of a meat product.]

Unilever NV

Netherlands Patent Application 7 806 080 (1979) [NI]

A method for making a compact meat loaf out of small pieces of meat involves working the raw meat pieces until a viscous secretion appears on the surface; adding an effective quantity of an emulsifier and continuing to work the meat pieces until the emulsifier is evenly distributed; and filling a container completely with the meat pieces, pressing them firmly and heating in such a way that the centre reaches a temp. of $\geq 60^{\circ}\text{C}$. This method can be used with any kind of meat and even poultry or fish. The product obtained can be sliced and re-heated without falling apart. W&Co

133

Incidence and control of microorganisms on poultry products. [Review]

Dawson, L. E.; Chipley, J. R.; Cunningham, F. E.; Kraft, A. A.

Research Report, Agricultural Experiment Station, Michigan State University No. 383, 36pp. (1979)

[203 ref. En] [Dep. of Food Sci. & Human Nutr., Michigan State Univ., East Lansing, Michigan 48824, USA]

This publication summarizes research related to incidence and control of microorganisms on poultry meat, with major emphasis on bacteria. Headings include: methods for determining product contamination; incidence of specific microorganisms; plant management practices to control microbes, covering sanitary processing, equipment-cleaning, scalding, evisceration and airborne microorganisms; effective chilling of poultry and preparation for market, including water chilling, air chilling, washing, pasteurizing, and packaging; control of microorganisms by specific treatments, covering cooking, canning, freezing, moisture content control, radiation, gases, chemicals, antibiotics, halogens, acids, salts, polyphosphates, antimicrobial ice, chelating agents, miscellaneous compounds and smoking; and specific product considerations including further processed and cooked products - up to 1959 and development after 1960 (mechanically deboned meat, frozen products and prestuffed products). SP

134

[Phage-typing of *Staphylococcus aureus* from slaughter poultry.] Lysotypie von *Staphylococcus aureus* des Schlachtgeflügels.

Hentschel, S.; Kusch, D.

Zentralblatt für Bakteriologie, IB 170 (5/6) 492-501 (1980) [31 ref. De, en] [Inst. für Lebensmittelhygiene, Fleischhygiene & Tech., Fachrichtung Lebensmittelhygiene, Freie Univ., Berlin]

445 strains of *Staphylococcus aureus* were isolated from poultry and a further 345 strains were isolated from the personnel of a poultry processing plant. The

strains were typed with the International Basic Set (IBS) and a set of poultry phages according to Gibbs et al. [see FSTA (1978) 10 6S921]. In total, it was possible to type 38% more of the staphylococci with the poultry set than with the human set, of which the most frequent phage reaction occurred in phage groups III (human set) and B₁ (poultry set). 83% of all the strains which were not typable, using the IBS, were however typable with the poultry set. Poultry specific staphylococci, classified according to biochemical characteristics, in general did not react with the human set. They did, however, show the most frequent reaction in phage groups A and A/B₂ of the poultry set. The human specific strains were almost all typable with the IBS. They also reacted frequently with the phage group B₁ of the poultry set, mainly in combinations of B₁/III and B₁/NT. In contrast to the IBS, the poultry phage set exhibited a lower specificity, in that a greater number of strains were typable with the poultry set which were classified by biochemical characteristics as human specific. It was also possible to type about 70% of the human staphylococci with both sets. A clear classification into the poultry biotype appeared to be possible only with strains reacting with phages of group A of the poultry set. AS

135

[Process for continuous thermal treatment of food products.]

Kibleur, P. P. M.; Blaizat, C. A.

French Patent Application 2 425 812 (1979) [Fr]

Procedure for pre-cooking, sterilization, pasteurization or bleaching of vegetables, meat, fowl, etc. in an air-tight container is characterized in that after loading, the walls of the container are heated at above the temp. at which the food products are to be treated. The container is sealed and evacuated and a small amount of steam, alcohol or other vapour is allowed to enter and is adsorbed onto the food material and not onto the heated walls. W&Co

136

[Process and apparatus for treating food products with water atomized by an electrostatic field.]

Vermorel, D. R. L.

French Patent Application 2 422 338 (1979) [Fr]

A process is described for heating or cooling poultry by a water spray formed by an electrostatic generator in which one pole is attached to the spray nozzles and the other to the hooks on which the poultry is suspended. The same procedure may be applied advantageously to meat in general, fish, vegetables or fruit, either wrapped or unwrapped. W&Co

137

[Device for packaging food products.]

Renaissance Conseil

French Patent Application 2 423 411 (1979) [Fr]

The package consists of 2 concave, transparent shells of any desired shape or size, which come together to enclose the food product, particularly meat or fowl. The 2 shells are articulated, with a spacing piece between them to prevent complete closure and provide air

circulation. Two wings are provided above to form a carrier handle. W&Co

138

Heat shrinkable multilayer packaging film of blended copolymers and elastomers.

Lustig, S.; Vicik, S. J.; Kohler, W. J. (Union Carbide Corp.)

United States Patent 4 196 240 (1980) [En]

A heat shrinkable multilayer packaging film of blended copolymers and elastomers adapted for packaging frozen poultry is described. IFT

139

Feather plucking apparatus.

Bergeron, C. F.

United States Patent 4 199 842 (1980) [En]

Plucking apparatus is described which is in the form of a closed chamber containing a number of resilient flailing plucking members and means for creating a flow of air through the housing to exhaust the feathers. IFT

140

Refrigeration system.

BOC Ltd.

UK Patent Application 2 027 183A (1980) [En]

A process is described in which animal carcasses or poultry are sprayed with a cryogenic liquid to quick freeze a thin external layer to preserve moisture, followed by cold storage. IFT

141

[Hygiene control of poultry slaughtering plants: technique of Enterobacteriaceae detection.]

Zur Enterobacteriacean-Nachweisteknik im Rahmen der Hygieneüberwachung von Geflügelschlachtbetrieben. Weise, E.; Trommer, E.

Schlachten und Vermarkten 80 (3) 67-70 (1980)

[34 ref. De, en, fr] [Inst. für Veterinärmedizin des Bundesgesundheitsamtes (Robert von Ostertag-Inst.), Thielallee 88-92, D-1000 Berlin 33]

Enterobacteriaceae counts in 60 broilers immediately after slaughter, determined on violet-red-bile glucose (VRBG) agar gave similar results when incubated for 18 h at 37°C or 24 h at 30°C. There were no differences in counts, or shifts in the spectrum or organisms or growth of unspecific organisms. Practical advantages of a 30°C incubation temp. include incubating in the same oven as for total counts, and application of the method to chilled or frozen fresh poultry meat, which may contain psychrotrophic partly cold-damaged Enterobacteriaceae. It can be used for hygiene control in poultry slaughtering and cutting establishments. The carcasses of commercially slaughtered animals exhibited, after cooling in a water bath, Enterobacteriaceae counts (log₁₀) of 4.4 to 4.7/g of skin: 90% *Escherichia coli*, and *Citrobacter*, *Enterobacter*, *Klebsiella*, *Proteus* and *Salmonella* spp. (*S. haardt*, serological group C, 1 only). RM

142

New processing plant.

Anon.

Poultry International 18 (13) 20, 22, 24 (1979) [En, de, fr, it, es]

The new Van Miert poultry slaughterhouse and processing plant at Breukelen, Netherlands (capacity 4000 birds/h) is described; aspects considered include delivery of the birds, cleaning of crates, and stunning, killing, scalding, plucking, evisceration, washing, weighing, grading, chilling, cutting, and packaging of the birds. AJDW

143

Poultry meat inspection.

Driessen, J.

Poultry International 18 (13) 26, 28 (1979) [En, de, fr, es, it]

Aspects discussed include: modernization and mechanization in the poultry industry; hygiene aspects; the EEC directive on veterinary inspection of poultry; approval of poultry slaughterhouses; training of inspection personnel; and elimination of barriers to intra-EEC code in poultry meat. AJDW

144

Poultry grading.

Stork Brabant BV

British Patent 1 561 074 (1980) [En]

Poultry handling and wt. grading apparatus is described employing multiplexing of a single electronic control to serve multiple lines of birds. IFT

145

Poultry processing.

Gielnik, H. (Munchmeyer & Co.)

United States Patent 4 192 040 (1980) [En]

Apparatus is described for opening and cleaning the stomachs of small animals, such as poultry. IFT

146

Influence of salt addition on tenderness of hot boned pork, chicken, turkey, and beef rolls.

Furumoto, E. J.; Stadelman, W. J.

Journal of Food Science 45 (4) 1062-1063 (1980) [En] [Dep. of Anim. Sci., Purdue Univ., West Lafayette, Indiana 47907, USA]

Hot and cold boned pork, chicken, turkey and beef were cubed and mixed for 30 min either with 1.5% added NaCl or without added NaCl. Meat was then stuffed into fibrous casings and steam cooked to 76°C. Rolls were evaluated for tenderness using a Kramer shear cell attached to an Instron Universal Testing Machine. Peak heights (kg) divided by sample weights (g) were statistically analysed. Regardless of rigor state, the addition of NaCl significantly improved tenderness of all 4 meat types. For pork and chicken rolls with 1.5% NaCl there was no significant effect on tenderness due to boning method. Cold boned turkey rolls with 1.5% NaCl were more tender than hot boned rolls with 1.5% NaCl. The most tender treatment combination for beef rolls was hot boned meat with 1.5% NaCl. IFT

147

[Pre-slaughter handling and transport of poultry.]

Yakimov, V. P.; Nanos, V. R.; Borovkov, S. M.; Rvankin, S. P.

Myasnaya Industriya SSSR No. 12, 40-42 (1979) [Ru]

[Nauchno-proizvodstvennoe Ob"edinenie

Ptitsepererabatyvayushchei Promyshlennosti

'Kompleks', USSR]

The experiments carried out with chicks of laying breeds, broilers, hens, turkeys, ducks, and geese showed that starving for more than 4-12 h before slaughter entailed considerable losses of glycogen and fat from breast muscles, and a considerable decrease of yield. It is therefore recommended that hens, broilers, chicks, and turkeys should not be starved for longer than 8-12 h, and ducks and geese for longer than 4-8 h before slaughter. STI

148

[Proposed methodology and criteria for the sensory evaluation of chicken meat.]

Cortanovacki, S.

Tehnologija Mesa 20 (4) 124-127 (1979) [Sh, en]

[Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

Sensory evaluation of the quality of poultry meat is discussed, with special reference to methods and criteria for evaluation of wholesomeness, detn. of commercial quality, and checking of the accuracy of labelling and nomenclature. STI

149

Evaluation of four purine compounds in poultry products.

Young, L. L.

Journal of Food Science 45 (4) 1064-1065, 1067 (1980)

[En] [USDA Richard B. Russell Agric. Res. Cent., SEA-AR, PO Box 5677, Athens, California 30604, USA]

The levels of 4 purine compounds (adenine, guanine, hypoxanthine, and xanthine) were evaluated in some poultry products. The levels of total purines in light and dark meat were lower than what has been reported for other foods but the level of hypoxanthine was somewhat higher. In contrast, the level of total liver purines was higher than in other broiler tissues but the liver contained mostly adenine and guanine. The levels of all purines were relatively low in gizzard and mechanically deboned broiler tissues. IFT

150

Methods for the microbiological examination of food. III. Examination of specific products. Section 2. Poultry.

Australia, Standards Association of Australia

Australian Standard AS 1766.3.2-1979, 5pp. (1979)

[En]

The procedures apply to any dressed poultry, domesticated or otherwise. The sample may consist of whole or portions of poultry which may be coated or uncoated, cooked or fresh, chilled or frozen. The standard covers storage of samples (frozen samples at -15°C, and chilled samples at 0-2°C until tested), diluents and apparatus, preparation of 1st dilution, examination for specific organisms [see preceding

abstr.], calculation of results, and report. [See also following abstr.] AL

151

Standardization and quality control in poultry industry in India.

Santwani, M. T.

Poultry Guide 17 (2) 31-36 (1980) [En] [Indian Standards Inst., New Delhi, India]

Current Indian standards applicable to poultry and eggs are briefly discussed. They are: IS:6659-1972 (Code of practice for ante- and post-mortem inspection of poultry); IS:7049-1973 (Code for handling, processing quality evaluation and storage of poultry); IS:4674-1975 (Dressed chicken, chilled and frozen); IS:5558-1970 (Chicken essence); IS:4723-1978 (Egg powder); IS:6558-1972 (Code of practice for cold storage of shell-eggs); and IS:8539 (Part I)-1977 (Terminology of meat products and meat animals. I. Poultry). Further standards for poultry products are in preparation. CFTRI

152

The food industry in India.

India, Central Food Technological Research Institute *Monographs on Appropriate Industrial Technology, United Nations Industrial Development Organization* No. 7, 75-91 (1979) [En] [Mysore, India]

[Contd. from preceding abstr.] Per capita meat consumption is only 14 g/day, mainly sold fresh; small amounts of ham, bacon, sausages and canned curried meats are also produced. The primary requirement is modern abattoirs, recovery of by-products and improved, disease-free livestock. The annual catch of fish is about 2.3 million t, with further potential for rapid expansion of inland fish culture. There are large and successful exports of processed and frozen shrimps and prawns, but there are high losses of other fish due to inadequate handling facilities, particularly chilling. Canning is used mainly for sardines, tuna and shrimps, but large quantities of fish are salted and dried, or pickled, using primitive methods which could be improved. The poultry industry is expanding and production of egg powder and albumen flakes is well established, although egg losses are large due to inadequate refrigeration. Consumption of chicken meat is a new trend, but processed products are developing e.g. chicken sticks, sausages, soups, canned curries and cured dressed poultry, all requiring high hygienic standards of production. [Contd. in following abstr.] ELC

153

[Microbiological contamination of poultry meat during initial processing and refrigerated storage.]

Panov, V. P.; Lubyanskiy, S. A.

Izvestiya Vysshikh Uchebnykh Zavedenii, Pishchevaya Tekhnologiya No. 5, 62-64 (1979) [10 ref. Ru] [Voronezhskii Tekh. Inst., Voronezh, USSR]

The total microbial count and microflora of poultry cooled by a continuous water-immersion procedure were studied. Total count was reduced to 78% of the initial value. *Escherichia coli* comprised 95% of the Enterobacteriaceae count in the cooled poultry. Total

microbial contamination level of the poultry is dependent on initial quality and processing conditions. The cooled poultry can be held for 5 days at 275-277 K without microbial spoilage. STI

154

Influence of culinary processes on terminal residues of chlorinated pesticides and vitamin E in poultry meat.

Szokolay, A.; Uhnak, J.; Sackmauerova, M.

Mitteilungen aus dem Gebiete der Lebensmitteluntersuchung und Hygiene 71 (2) 253-259 (1980) [18 ref. En, fr, de] [Res. Inst. of Preventive Med., Bratislava, Czechoslovakia]

Samples of poultry meat from birds fed diets containing HCB and BHC at levels of 1 or 50 p.p.m. were used in studies on changes in residues of these compounds and their degradation products during roasting or frying (twice) of poultry meat in vitamin E-fortified oil. HCB concn. decreased relatively little during roasting, but appreciably during frying. HCB concn. in oil increased considerably during roasting and frying. Of HCB metabolites, 2,4-dichlorophenol had the greatest heat stability, followed in order of decreasing heat stability by 2,4,6-trichlorophenol, pentachlorophenol and 1,2,4,5-tetrachlorophenol. No data are given for losses of BHC during heat processing. Concn. of vitamin E in the oil decreased during heat treatment of meat samples, the decrease being greater for pesticide-spiked meat than for non-spiked meat. This effect was not dependent on pesticide concn. AJDW

155

[Microbial count of slaughter poultry, and thawing method for frozen poultry.] Keimgehalt bei Schlachtgeflügel und Auftauverfahren für Geflügel.

Anon.

Fleischerei 31 (5) 586, 588-592 (1980) [De]

Aspects discussed include: the relatively high microbial counts of living poultry and poultry meat; changes in microbial counts during various stages of the slaughter process; cross-contamination with pathogens; spoilage bacteria; sources of bacteria in poultry processing plants; microorganisms occurring on fresh or frozen poultry; methods for thawing of frozen poultry, and the danger of cross-contamination by drip, thawing water, etc.; and the importance of personal and plant hygiene. AJDW

156

Gizzard processing.

Hazenbroek, H. E.

United States Patent 4 203 178 (1980) [En]

A method is described for separating gizzards from attached entrails by engagement while travelling on a pair of side by side chain conveyor means with a pair of oppositely rotating, spirally threaded rollers. IFT

157

Wing cutting apparatus.

Gasbarro, G. N.

United States Patent 4 207 653 (1980) [En]

An automated poultry wing cutting apparatus is described which employs a rotatable drum-like member having wing receiving grooves disposed on its outer surface and knife means mounted upon a supporting frame to engage the wings in a force-transmitting relationship and at a predetermined location. IFT

158

Poultry batter coating.

Evans, D. N.; Moore, W. W.; Ng, J. L. (General Foods Corp.)

United States Patent 4 208 442 (1980) [En]

A dry coating composition is described, which, when coated onto a moistened fowl and then baked imparts a crisp, uniform and adhesive coating with the taste, texture and appearance of a fried coated fowl. IFT

159

[Effect of nutrition and stocking density on slaughter value of goslings.]

Koucky, M.; Hudsky, Z.

Zivocisna Vyroba 24 (9) 673-679 (1979) [13 ref. Cs, ru, en, de] [Vyzkumny Ustav Zivocisne Vyroby, 251 61 Prague-Uhrineves, Czechoslovakia]

Groups of 200, 160 or 120 Rhenish goslings were kept on slatted floors with limited access to runs at densities of 5, 4 or 3 goslings/m² resp. At each density, 1 group received a control ration and 1 received an experimental ration (lower in N and higher in fibre content). Tabulated results of slaughter at 56 days include the following mean values for experimental and control goslings resp. at the 3 stocking densities stated: slaughter wt. (g), 3724 and 3938, 3813 and 3907, and 3838 and 4079; slaughter yield (%), 70.3 and 72.1, 70.3 and 71.1, and 69.5 and 69.5; breast muscles as % carcass wt., 9.3 and 9.0, 8.8 and 9.0, and 9.8 and 9.7; and thigh muscles similarly, 17.3 and 17.2, 16.9 and 17.7, and 17.2 and 17.9. Detailed chemical analysis data for 8 goslings from each group include the following values for hydroxyproline content (mg/100 g): 148 and 203, 190 and 201, and 193 and 163. The economic aspects of the different treatments are discussed. SKK

160

[Effect of stocking density on slaughter value of broiler ducks.]

Hudsky, Z.; Machalek, E.

Zivocisna Vyroba 24 (9) 681-686 (1979) [11 ref. Cs, ru, en, de] [Vyzkumny Ustav Zivocisne Vyroby, 251 61 Prague-Uhrineves, Czechoslovakia]

In an experiment analogous in design to that described in the preceding abstr., groups of 200, 150 or 100 ducklings (equal numbers of both sexes) of the 243 cross were kept on experimental or control rations at densities of 8, 6 or 4 ducklings/m². The experimental ration was higher in energy and lower in N content than the control ration. Tabulated results of slaughter at 49 days include the following overall mean values for experimental and control broilers resp. at the 3 stocking densities stated: slaughter wt. (g): 2791 and 2528, 2927 and 2844, and 2628 and 2859; slaughter yield (%), 71.9 and 71.5, 71.4 and 72.1, and 71.6 and 71.8; breast muscles as % carcass wt., 9.6 and 9.7, 9.4 and 9.9, and 9.8 and

10.2; and thigh muscles similarly, 11.2 and 11.5, 11.5 and 11.2, and 12.2 and 11.5. Hydroxyproline contents were correspondingly (mg/100 g): 104 and 70, 110 and 66, and 71 and 95. SKK

161

[Automation and mechanization - poultry, eggs and other problems. Collection of research results, 1963-1975.] Automatizacia a mechanizacia - hydina, vajcia, ostatna problematika. [Book]

Czechoslovakia, Vyskumny Ustav Hydinarskeho Prumyslu

118pp. (1978) [Sk] Bratislava, Czechoslovakia; VUHP

The collection comprises results of studies completed at the machinery and development department of the Research Institute of the Poultry Industry in Bratislava. Chapters are: Automation of poultry processing, and mechanization of technological operations (pp. 5-54); Materials handling and other problems (pp. 55-88); Mechanization of technological operations during the handling and processing of eggs (pp. 89-99); and Problems of the processing of other poultry products (pp. 100-117). STI

162

[Determination of extraneous water uptake by poultry carcasses during countercurrent immersion cooling.] Untersuchungen zur Bestimmung der Fremdwasseraufnahme bei Schlachtgeflügel während der Gegenstromtauchkühlung.

Ehinger, F.

Archiv für Geflügelkunde 44 (1) 10-17 (1980) [17 ref. De, en, fr, ru] [Inst. für Tierhaltung & Tierzüchtung, Univ. Hohenheim, 7000 Stuttgart 70, Federal Republic of Germany]

Studies were conducted at 2 poultry slaughterhouses on effects of time in the spin-chiller (20-40 min), subsequent dripping time (1-3 min), and carcass presentation (with or without giblets) on extraneous water content of broilers cooled in a counter-current spin-chiller. A total of 840 carcasses were studied at each slaughterhouse. Water uptake and extraneous moisture content were determined and evaluated by the methods specified in EEC Directive 2967/76, i.e. drip, protein/water ratio or fat-free DM/water ratio. Tables of results are given. The results show that water uptake tended to increase with increasing chilling time but to decrease with increasing drip time; carcasses with giblets took up more water than those without giblets. Actual extraneous water content was closely correlated with drip; protein/water ratio and fat-free DM/water ratio were not satisfactory for detn. of extraneous moisture content. AJDW

163

[Effects of EEC veterinary legislation on analyses and charges during exports.] Auswirkungen des EWG-Rechts im Veterinärbereich auf Untersuchungen und Untersuchungsgebühren anlässlich des Grenzübertritts.

Naser, S.; Zrenner, K.

Schlachten und Vermarkten 80 (3) 75-81; (4) 111-115 (1980) [De] [Bayerisches Staatsministerium des Innern, Odeonsplatz 3, 8000 Munich, Federal Republic of Germany]

The EEC veterinary legislation regarding analysis and charges during intra- and extra-community trade in meat and poultry products is discussed. RM

CHICKENS

1

[Comparison of two methods of determining *Proteus* organisms in foods.]

Pantyukhova, Z. I.

Gigiena i Sanitariya No. 8, 55-56 (1979) [2 ref. Ru]

[Mezhdurechenskaya Gorodskaya Sanepidstantsiya, Mezhdurechensk, USSR]

The method of (i) Shukevich [Kalina & Komarova (1975) *Zhurnal Mikrobiologii* No. 12, 54-61] was compared with that of (ii) Kalina & Komarova [*Ibid.*] for detn. of *Proteus* spp. in 700 samples of meat products (minced meat dishes, roast chicken, sausages); the latter method involves use of a liquid enrichment medium followed by a selective solid medium incorporating polymyxin, crystal violet and bile salts or dried bile. Numbers of samples giving positive *Proteus* results were 0 and 22 for (i) and (ii), resp. HBr

2

Effect of feed and water withdrawal from broilers on weight loss and carcass yields.

Murphy, B. D.; Goodwin, T. L.

Arkansas Farm Research 27 (5) 9 (1978) [En]

[Arkansas Agric. Exp. Sta., Univ. of Arkansas, Div. of Agric., Fayetteville, Arkansas 72701, USA]

Feed and water were withdrawn from 56-day old broilers for 8, 12, 16 or 20 h prior to slaughter. Wt. loss after 12 h withdrawal was 3.99%, and carcass yield (without giblets) was 63.37% of live wt. This yield was not significantly different ($P > 0.05$) from those for 16 and 20 h withdrawal, indicating that 12 h withdrawal is adequate to minimize wt. loss and maximize carcass yield. JRR

3

Biophysical and organoleptical evaluation of hot-packaged cut-up broiler meats.

Arafa, A. S.; Chen, T. C.

Poultry Science 57 (6) 1567-1572 (1978) [26 ref. En]

[Agric. & Forestry Exp. Sta., Poultry Sci. Dep., Mississippi State Univ., Mississippi 39762, USA]

Hot-packaging of broilers greatly reduced drip formation upon refrigerated storage. Higher drip formations were observed for cut-up parts than for the whole carcass in both treatments. These increases in drip formation were found to be proportional to the number of cut-up parts from each carcass. Higher cooking yields and Warner-Bratzler readings and shorter sarcomere lengths were observed for the hot-packaged samples as compared to the immersion chilled samples. However, taste panel evaluation did not yield any significant differences in tenderness, flavour juiciness, and overall satisfaction between both treatments. Significant correlations were found between Warner-Bratzler readings and % cooking losses. In addition, a significant correlation was observed between Warner-Bratzler readings and sarcomere lengths. AS

4

Effect of reduced dietary protein and amino acid levels on the performance of broiler chickens.

Koreleski, J.; Rys, R.

Feedstuffs 51 (38) 39-42 (1979) [20 ref. En] [Dep. of Anim. Nutr., Inst. of Zootech., Krakow, Poland]

Studies on effects of variation of protein content of the diet on the performance and carcass quality of broilers slaughtered at 8 wk of age are described. The broilers were fed diets decreasing from 25% to 19% protein, 25% to 15% protein, 19% to 13% protein or 16% to 14% protein in a single step at 4 wk of age, or diets with alternation of these protein concn. at 2-3 day intervals, over the age ranges 3-6 or 3-8 wk. A table of results gives data for dressing %, % breast meat in the carcass, % thigh meat in the carcass, and % internal body fat. The results show that alternate feeding of high- and low-protein diets at 2-3 day intervals resulted in less fat accumulation than conventional feeding with a high-protein starter and lower-protein finisher diet. The reduction in fatness was greater if the alternating protein level treatment was continued up to slaughter than if it was terminated 2 wk before slaughter. The highest dressing % and lowest thigh meat % were recorded for the 16%/14% protein non-alternating treatment. The 25%/19% protein (non-alternating) treatment gave the lowest dressing % and highest thigh meat %. Feed regime did not significantly influence % breast meat in the carcass. AJDW

5

[Method for cooking young chicken.] Verfahren zur Herstellung von gebackenem Junghuhn.

Szczesny, A.; Szczesny, E.

German Federal Republic Patent Application

2 747 213 (1979) [De]

The young chicken is cut into pieces which are then cooked in a microwave oven and coated with a panade comprising a dough made from flour, eggs, honey, milk, seed oil, spices and partly compressed cornflakes. The chicken pieces thus prepared are then fried in hot fat until they have a golden brown colour. The method is particularly suitable for use in restaurants and hotels because the cooking process can be effected separately from the preparation stage. W&Co

6

Protein requirement of growing chicks in Egypt.

II. Effects of varying levels of dietary protein on meat yield of Dandarawi and Leghorn chicks.

Abd-El-Hamid, M. A.; Khalifah, M. M.; Abou Akkada, A. R.; Abou-El-Azm, I. M.; Khalil, A. A.

Alexandria Journal of Agricultural Research 26 (2) 283-288 (1978) [10 ref. En, ar] [Animal Production Dep., Fac. of Agric., Univ. of Alexandria, Alexandria, Egypt]

Effects of feeding rations containing (i) 17, (ii) 20, (iii) 23 and (iv) 26% protein in summer and winter on meat yield of Leghorn and Dandarawi chickens, were studied. Chickens were slaughtered at 16 wk of age; results are tabulated, and show that (ii) gave the highest % of liver and edible portion for Dandarawi, while (i) gave superior values for Leghorns. Dandarawi bred in summer gave higher edible portion than those reared in winter, the opposite was true for Leghorn. With respect to edible portions, males surpassed females when fed (i) or (ii), but the reverse was true for (iii) or (iv). [See following abstr. for part III.] SP

7

Protein requirements of growing chicks in Egypt. III. Effects of varying levels of dietary protein on the constituents of blood and muscles of Dandarawi and White Leghorn chicks.

Abd-El-Hamid, M. A.; Khalifah, M. M.; Abou-Akkada, A. R.; Abou-El-Azm, I. M.; El-Shannawy, M. M. *Alexandria Journal of Agricultural Research* 26 (2) 289-299 (1978) [21 ref. En, ar] [Animal Production Dep., Fac. of Agric., Univ. of Alexandria, Alexandria, Egypt]

Effects of feeding rations containing 17, 20, 23 and 26% protein during summer and winter on muscle constituents of White Leghorn and Dandarawi chickens at 16 wk of age, were studied. Results are tabulated and show that: moisture content of breast muscles of Dandarawi were higher than for Leghorn chickens; Dandarawi had higher fat % in red and white meat than Leghorn chickens; protein and ash % were higher in red and white meat of Leghorn than Dandarawi chickens; summer reared chickens had higher chemical constituent values than winter reared chickens for red and white meat; increasing dietary protein resulted in a slight increase and decrease of muscle protein and fat resp.; red meat had higher % moisture and fat than white meat; and white meat had higher % protein and ash than red meat. [See preceding abstr. for part II.] SP

8

Influence of carbon source, bile salts and incubation temperature on recovery of *Enterobacteriaceae* from foods using MacConkey-type agars.

Mossel, D. A. A.; Eelderink, I.; Koopmans, M.; Rossem, F. van

Journal of Food Protection 42 (6) 470-475 (1979) [59 ref. En] [Dep. of Sci. of Food of Anim. Origin, Univ. of Utrecht, Bilstraat 172, 3572 BP Utrecht, Netherlands]

Replacement of coliform bacteria as indicator organisms in foods processed for safety with the *Enterobacteriaceae* has called for development of a rigorously standardized formula for violet red bile glucose agar and for assessment of the optimal incubation temp. 4 reference strains of *Enterobacteriaceae*, 120 samples of minced meat and 100 samples of frozen broiler chickens were studied. Considerable differences in the performance of commercially available dried formulae, when used as poured plates were observed. These applied both to productivity and to the type of colony produced by a given pure culture. As expected, replacement of lactose + glucose by an equimolar amount of glucose did not influence the performance of the medium. Intrinsic toxicity of some batches of medium to non-stressed *Enterobacteriaceae* appeared to be mainly responsible for substandard performance. It could be overcome by careful selection of the preparations of crystal violet and particularly the bile salts used in the formulae. Incubation at 30°C led to higher confirmed colony counts in minced meat than at 37°C. However, incubation temp. did not greatly influence similar counts in broiler drip. This observation could be substantiated by identification of the types of *Enterobacteriaceae* isolated from the 2 commodities. Psychrotrophic spp. predominated in minced meats, which are often made from raw materials stored for some time under

refrigeration, whereas mesophilic species were in the majority on frozen broilers, which are generally frozen shortly after slaughter. AS

9

Insect protein as a possible source of protein to poultry.

Abdel Gawaad, A. A.; Brune, H.

Zeitschrift für Tierphysiologie, Tierernährung und Futtermittelkunde 42 (4) 215-222 (1979) [17 ref. En] [Inst. für Tierernährung der Justus-Liebig-Univ., Giessen, Federal Republic of Germany]

40 Lohmann white broiler chickens were used in a study on effects of substitution of insect larva meal (ILM) prepared from larvae of *Musca domestica* and *Phormia terrae novae* for soybean meal (SBM) in the diet on performance and carcass quality. The broilers received the diets containing SBM or ILM from 3 days of age up to slaughter at 4 wk of age. Tables of data are given for various carcass characteristics of broilers fed the 2 diets. The results showed no significant effect of diet on the liver wt., breast muscle wt. or leg wt. of the birds. The ILM diet gave higher DM and fat concn. but lower protein concn. in the breast and leg muscle than the SBM diet; differences in ash content were small. Breast meat from ILM-fed broilers was slightly more yellow/brown in colour than that from SBM-fed broilers. Meat from broilers fed both diets had normal aroma and flavour, although flavour intensity was slightly greater for the ILM-fed broilers. AJDW

10

Effect of supplementation of methionine in the diet on broiler meat characters.

Ayodhya Prasad

Indian Poultry Gazette 62 (1) 37-39 (1978) [8 ref. En] [Div. of Poultry Res., Indian Vet. Res. Inst., Izatnagar, Uttar Pradesh, India]

DL-methionine was added to diets (4 different protein and energy levels) to raise the methionine + cystine (M + C) level to 0.86 or 1%. Broiler chicks 1 wk of age at the start of the trial were fed the experimental diets up to 7 wk of age. The birds were evaluated for ready-to-cook wt., breast angle, sensory quality, liver wt. and liver fat. A significant decrease in breast angle and non-significant decrease in ready-to-cook wt. was noted as a result of increased dietary M + C level. No significant difference in meat texture and flavour or in the wt. or fat content of liver was observed as a result of methionine supplementation. CFTRI

11

Influence of microorganisms on the carbonyl compounds of chicken tissue.

Moerck, K. E.; Ball, H. R., Jr.

Journal of Agricultural and Food Chemistry 27 (4) 854-859 (1979) [37 ref. En] [Dep. of Food Sci., N. Carolina State Univ., Raleigh, N. Carolina 27650, USA]

Broiler adipose and thigh muscle tissue samples were inoculated with bacteria and yeasts, then stored for 3 days at 22°C or 7 days at 4°C. Hexane-extracted carbonyl compounds were converted to their 2,4-dinitrophenylhydrazone derivatives, separated, and identified. *Pseudomonas fluorescens* and *Candida*

lipolytica produced acetone in both tissue samples. *Rhodotorula aurantiaca* produced acetone in ground thigh muscle. *P. fragi* and *P. aeruginosa* produced acetone and trace amounts of 2-butanone, 2-hexanone, and 2-octanone in all tissue samples. 5 *Pseudomonas* spp., *Achromobacter lipolytica*, and *C. lipolytica* decreased the concn. of at least one class of aldehyde in all samples and decreased peroxide levels in stored and rancid adipose tissue. *Trichosporon pullulans* and *R. aurantiaca* decreased the concn. of aldehydes in samples stored for 3 days at 22°C. Dicarbonyl compounds were removed by *R. aurantiaca* and *A. lipolytica*. *A. Micrococcus* sp. increased peroxides and aldehydes in stored samples and also rancid adipose tissue. AS

12

Effect of feeding level on the content of nucleic acids in the pectoral and leg muscles in growing White Plymouth Rock chicken.

Antoszevska, B.

Prace i Materiały Zootechniczne No. 18, 61-76 (1979) [28 ref. En, pl, ru] [Polska Akad. Nauk, Inst. Genetyki i Hodowli Zwierząt, Jastrzebiec, 05-551 Mrokow, Poland]

63 White Plymouth Rock chickens were used in a study on the effect of age (5-23 wk) and feeding level (i) high or (ii) moderate, feed allowance increasing by 2.5 or 1.25 g DM daily, resp.) on the DNA and RNA contents of the pectoral and thigh muscles. Tables and graphs of results are given. Increase in mass of pectoral and thigh muscles with age was greater for (i) than (ii). RNA contents of both muscles increased with increasing age of the chicken, muscles of (i) birds always having higher RNA levels than (ii) birds. However, the difference between (i) and (ii) decreased with increasing age for the pectoral muscles but increased with increasing age for the thigh muscles. DNA concn. followed a similar pattern, except that the difference between (i) and (ii) increased with increasing bird age in both muscles. The relation of RNA concn. to muscle mass differed between (i) and (ii) in the pectoral muscle, but not in the thigh muscle. The relation between DNA concn. and muscle mass did not differ significantly between (i) and (ii) in either muscle. AJDW

13

Effect of feeding level on the content of basic protein fractions in the pectoral and leg muscles of growing White Plymouth Rock hens.

Antoszevska, B.

Prace i Materiały Zootechniczne No. 18, 77-91 (1979) [24 ref. En, pl, ru] [Polska Akad. Nauk, Inst. Genetyki i Hodowli Zwierząt, Jastrzebiec, 05-551 Mrokow, Poland]

48 White Plymouth Rock hens were used in a feeding trial (over the age range 2-11 wk) conducted to evaluate effects of level of feeding, high (H) or low (L) (daily feed DM intake being increased by 3 or 1.5 g resp.) on the content of total protein and myofibrillar, sarcoplasmic and connective tissue protein in the pectoral and thigh muscles. Tables and graphs of results are given. The results show that hen age significantly influenced concn. of total crude protein and protein fractions in both muscle types; level of feeding

significantly influenced contents of crude protein and myofibrillar and connective tissue protein in both muscles; and leg and thigh muscles differed significantly in total crude protein and sarcoplasmic protein concn. Data for the 3 protein fractions expressed as % of total crude protein show that hen age and feed level both significantly influenced % myofibrillar and connective tissue proteins in the total protein; muscle type (pectoral vs. thigh) significantly influenced the % sarcoplasmic and connective tissue proteins in the total protein. The relation of protein fraction content to muscle wt. is also discussed. AJDW

14

[Production of chicken pepsin by an extraction method.]

Dolgikh, T. V.; Lobzov, K. L.; Volik, V. G.; Kozlova, L. V.; Khabarova, E. D.

Trudy, Vsesoyuznyi Nauchno-issledovatel'skii Institut Myasnoi Promyshlennosti No. 20, 109-115 (1976) [5 ref. Ru]

Effects of pH (2.0-3.0) temp. (30-40°C), and extraction time (1-24 h) on the content of pepsin in chicken extract were studied, together with the effect of the concn. of NaCl (3-25%) on salting out efficiency. Pepsin extraction was completed after 3 h at 30-35°C and 1 h at 40°C resp. The max. yield of pepsin in extract was obtained at pH 2.0-2.5 and temp. 35 and 40°C, with addition of 25 g NaCl to 100 ml extract. A method was developed for the production of pepsin from stomachs of hens and chickens. The extraction takes place at pH 2, temp. 35°C for 3 h, using a ratio of raw material to extraction liquid of 1:5, and salting out at pH 2.0, with NaCl concn. 25% at 18°C. The yield of pepsin of standard activity (100 000 units) is 250 to 300 g from 1 kg raw material. STI

15

Influence of heme pigments, nitrite, and non-heme iron on development of warmed-over flavor (WOF) in cooked meat.

Igene, J. O.; King, J. A.; Pearson, A. M.; Gray, J. I. *Journal of Agricultural and Food Chemistry* 27 (4) 838-842 (1979) [26 ref. En] [Dep. of Food Sci. & Human Nutr., Michigan State Univ., East Lansing, Michigan 48824, USA]

Removal of meat pigments and/or addition of 156 mg/kg of nitrite significantly ($P < 0.001$) inhibited lipid oxidation in cooked meat, which suggested that haem pigments may catalyse autoxidation. Taste panel evaluation confirmed the beneficial effects of removal of haem pigments and addition of nitrite as a means of controlling the development of WOF. The % of bound haem iron in fresh meat pigment extract was slightly over 90% while the level of free non-haem iron was < 10%. Cooking, however, released a significant amount of non-haem iron from bound haem pigments, which accelerated lipid oxidation in cooked meat. Thus, the increased rate of lipid oxidation in cooked meat is due to the release of non-haem iron during cooking, which catalyses lipid oxidation. Addition of 2% EDTA was shown to effectively chelate the non-haem iron and, thus, significantly reduced lipid oxidation. [Meat studied

was beef *longissimus dorsi* and chicken breasts and thighs.] AS

16

Effect of air contaminants on performance and quality of broilers. [Lecture]

Quarles, C. L.; Caveny, D. D.

Poultry Science 58 (3) 543-548 (1979) [28 ref. En] [Dep. of Anim. Sci., Colorado State Univ., Fort Collins, Colorado 80523, USA]

Air contaminated with dust, NH_3 or bacterial populations has been shown to adversely affect the performance and quality of broilers. Bacterial contamination of eggs and subsequently chicks broilers. Bacterial contamination of eggs and subsequently chicks leads to early mortality, and elevated levels of NH_3 encourage the ill effects of other stresses, such as infectious disease. [See FSTA (1980) 12 1G22.] JRR

17

Keeping quality of cured and/or smoked chicken stored at two different temperatures.

Singh, R. P.; Mahadevan, T. D.

Indian Poultry Gazette 62 (4) 138-144 (1978) [12 ref. En] [Poultry Res. Div., Indian Vet. Res. Inst., Izatnagar, Uttarpradesh-243122, India]

Dressed, cut-up chicken was cured for 72 h at 5-6°C in curing solution containing 13.6% NaCl, 6.8% cane sugar, 0.16% NaNO_2 , 0.21% NaNO_3 , 0.05% monosodium glutamate and 10 p.p.m. mycostation, smoked in hardwood smoke for 4 h at 40-45°C, and stored at room temp. (25-26°C) or under refrigeration (5-6°C). Untreated control samples became unfit for consumption after 24 h at room temp., or after 10 days under refrigeration. Cured chicken could be stored for 4 days at room temp. or 12 days under refrigeration, whereas cured and smoked chicken was edible after 12 days at room temp., and after 32 days under refrigeration. A taste panel preferred cured and smoked chicken over the other samples, for its colour, flavour, and taste. CFTRI

18

[Effect of added vegetables and conditions of storage on changes in free fatty acids in prepared poultry/vegetable products.]

Aleksiejczyk, Z.

Przemysł Spożywczy 33 (1) 15-17 (1979) [13 ref. Pl, ru, en, fr, de] [Inst. Żywnienia i Gospodarki Paszowej ART, Olsztyn, Poland]

Minced chicken, alone or with 10% carrots, celery, spinach or green peas, was baked in Al foil and subsequently stored for 1 month at 0°, 6 months at -10° or 9 months at -18°C. % of C14, C15, C16, C16:1, C17, C18, C18:1, C18:2 and C19:1 free fatty acids (FFA) were determined in the products. Results, given in graph and tabular form, showed that, in general, presence of the vegetables led to the higher retention FFA at all storage temp.; a protective effect on the unsaturated fatty acids was also observed. HBr

19

Effects of dietary fibers on liver lipid accumulation in chicks fed low-fat diet.

Akiba, Y.; Shiratori, S.; Matsumoto, T.

Japanese Journal of Zootechnical Science [Nihon Chikusan Gakkai-ho] 50 (7) 460-464 (1979) [11 ref. Ja, en] [Fac. of Agric., Tohoku Univ., Sendai-shi 980, Japan]

Groups of 14-day-old Single-Comb White Leghorn chicks were given diets containing either 0.4 or 6.0% fat, with or without 4% cellulose, polyethylene or polyamide powder as fibre sources. After 14 days on these diets, the birds were slaughtered, and their abdominal fat wt., liver wt. and the lipid content of the liver determined. Abdominal fat wt. increased with increasing dietary fat content. Addition of polyethylene to the diet tended to reduce abdominal fat wt. in the group fed the 6% fat diet, and to increase abdominal fat wt. in the low-fat diet. These differences were not, however, significant. Liver wt. and the lipid content of the liver decreased with increasing fat concn. in the diet. Feeding of cellulose decreased liver lipid in chicks fed the high-fat diet to a greater extent than in chicks fed the low-fat diet: feeding of polyethylene decreased liver lipid concn. to a greater extent for chicks on the low-fat diet than for those on the high-fat diet. Data are given for contents of triglycerides, diglycerides, free fatty acids, cholesterol, cholesterol esters and phospholipids in liver lipids of the various groups of birds. [From En summ.] AJDW

20

Utilization of chicken shanks in chicken soup.

Lachhramani, R. S.

Poultry Guide 16 (3) 23-25 (1979) [En] [Poultry Res. Div., IVRI, Izatnagar, 242 122, India]

Chicken shanks, a by-product from chicken processing factories, may be used to prepare a nutritive soup, the recipe for which is given. CFTRI

21

Comparison of two fattening chicken hybrids in four feeding systems.

Fraga, L. M.; Thanh, H.

Cuban Journal of Agricultural Science 13 (1) 47-55 (1979) [12 ref. En, ru] [Inst. de Ciencia Anim., Apartado 24, San Jose de las Lajas, Havana, Cuba]

700 Barred Plymouth Rock hybrid and 700 Cornish hybrid broilers were used in a comparative study on 4 diets, viz. (i) a control soybean/corn diet, and corn/soybean diets with addition of (ii) 10% Torula yeast, (iii) 20% final molasses or (iv) 30% rice polishings. The experimental diets were fed for 8 wk. Tables of data are given for performance and carcass quality characteristics of the birds. Diets (i) and (ii) gave the highest carcass wt. dressing %, viscera wt. and neck wt. Diet (iv) gave the lowest carcass wt., dressing % and viscera wt.; diet (iii) gave the lowest neck wt. Males had higher carcass wt., viscera wt. and neck wt. than females. The Cornish hybrids had higher carcass wt., neck wt. and viscera wt. than the Barred Plymouth Rock hybrids. AJDW

22

[Studies on hydrocarbons in tissues of chickens injected with a killed virus vaccine against Newcastle disease, emulsified with mineral oil.]

Franchini, A.; Piretti, M. V.

Clinica Veterinaria 102 (4) 301-308 (1979) [5 ref. It, en] [Istituto di Patologia Aviare, Univ. degli Studi di Bologna, Bologna, Italy]

18 male Hubbard meat-type chickens, 20 days of age at start of experiment, were used in a study on persistence of hydrocarbon residues in tissues of birds inoculated with a mineral oil emulsion vaccine against Newcastle disease. 12 of the chickens were injected with 0.5 ml vaccine in the muscle of the left thigh; the remaining 6 were not injected. Birds were slaughtered 6, 10, 18, 28, 48 or 70 days after injection; hydrocarbons in the soft tissues of the thigh were extracted and determined by GLC. Tables of data are given, including values for soft tissue wt., lipid wt. and %, unsaponifiable matter wt. and %, and hydrocarbon wt. and % in the soft tissues. Mean hydrocarbon concn. in the lipids of the thigh soft tissues of non-injected birds was 0.16%, vs. 2.0% for the injected birds. In both groups, hydrocarbon concn. varied considerably over the 70 day period studied. It is concluded that use of vaccines emulsified with mineral oil may lead to appreciable concn. of hydrocarbons in edible tissues. AJDW

23

A benefit-cost analysis of eradicating salmonella infection in chicken meat produced in Canada. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38]) [Lecture] Finn, P. J.; Mehr, B. pp. 203-238 (undated) [12 ref. En] [Economic Branch, Agric. Canada, Ottawa, Ontario, Canada]

Details are given of a cost-benefit analysis for elimination of human salmonellosis in Canada, assuming that all outbreaks are due to contaminated chicken meat. Other basic assumptions made are listed, and the analysis is made for an arbitrary 10 yr period. 1977 values of benefits and costs are \$23 663 842 and \$300 018 400, resp., i.e. a programme to eliminate salmonella from chicken meat would spend \$12 for \$1 benefit. This assumes that incidence of salmonellosis is 10 × higher than number of reported outbreaks, but it is stated that actual number of outbreaks could be 10-100 × those reported. DIH

24

National approach to salmonella control. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38]) [Lecture] Almlof, J.

pp. 239-252 (undated) [En] [AB Findus, Bjuv, Sweden]

Measures taken by AB Findus that enable it to produce 3 million chicken carcasses/yr with insignificant levels of salmonella contamination are described. Strict control of new breeding flocks, clean and hygienic rearing conditions, and use of heat-processed feed and potable water are seen as the most important measures. Other precautions include: arranging different processing operations in slaughter

premises in separate rooms, with no movement of personnel or tools between each; suspending carcasses so that viscera fall out without touching the body; chlorination of spin-chiller water; and protection of waste from flies and rodents. The programme has virtually eliminated salmonella in carcasses; of 123 355 examined in 1960-1976, 20 were positive for salmonella. Costs are well within tolerable limits. DIH

25

Tissue residues from feeding pentachloronitrobenzene (Quintozene) to White Leghorn chickens.

Dunn, J. S.; Bush, P. B.; Booth, N. H.; Farrel, R. L.; Thomason, D. M.; Goetsch, D. D.

American Journal of Veterinary Research 40 (9) 1227-1230 (1979) [16 ref. En] [Dep. of Physiol. & Pharmacology, SE Louisiana Univ., Hammond, Louisiana 70402, USA]

5 groups of 90 White Leghorn chicks (1 day old at start of experiment) were used in a study on residues of the fungicide Quintozene and its metabolites in tissues of chicks fed diets containing 0, 10, 50, 100 or 1000 p.p.m. Quintozene. Birds were slaughtered after 4 or 8 wk on the experimental diets. Various tissues were examined for lesions, and edible tissues were examined for residues of Quintozene, its metabolites and trace contaminants. Results show concn. of residues of pentachloronitrobenzene, hexachlorobenzene (HCB) and pentachlorobenzene in adipose tissue to be linearly related in Quintozene level in the diet; max. residue concn. observed for the above 3 compounds in adipose tissue were approx. 1.2, 100 and 9 p.p.m., resp. Accumulation of HCB in other tissues was less than in adipose tissue; in non-fatty tissues, HCB concn. were highest in heart, followed by thigh muscle, kidney, gizzard, liver and pectoral muscle. HCB accumulation in adipose tissue was lower for 8-wk-old than for 4-wk-old birds. In non-fatty tissues, accumulation of pentachlorobenzene was greatest in heart, followed by thigh muscle, gizzard, pectoral muscle, liver and kidney. Only traces of pentachloroaniline or pentachlorophenylmethylsulphide were detected. AJDW

26

Residues and effects from feeding high concentrations of hexachlorobenzene to broiler cockerels.

Hansen, L. G.; Dorn, S. B.; Beamer, P. D.

Poultry Science 58 (1) 81-86 (1979) [10 ref. En] [Div. of Pharmacology & Toxicology, Coll. of Vet. Med., Univ. of Illinois, Urbana, Illinois 61801, USA]

8-day old broiler cockerels received 0, 1, 10 or 100 p.p.m. dietary hexachlorobenzene (HCB) for 25, 38 or 52 days. Treated birds grew faster for the first 25 days, but the trend was reversed at later times so there was no net wt. difference at 52 days. Birds receiving 100 p.p.m. dietary HCB had significantly enlarged adrenal glands at 38 days and enlarged livers at 38 and 52 days. Equilibrium concn. in adipose tissue 12 to 13 times the dietary concn. were reached by 23 days in birds receiving 10 or 100 p.p.m. HCB. Birds receiving 1 p.p.m. concentrated HCB more effectively in the fat and did not reach equilibrium until 23 to 38 days. AS

27

Salmonellae in broiler poultry production in Ontario. (In 'International Symposium on Salmonella and Prospects for Control' [see FSTA (1980) 12 2C38]) [Lecture]

Mitchell, W. R.; McGarr, C.
pp. 95-102 (undated) [En] [Dep. of Vet. Microbiology & Immunology, Ontario Vet. Coll., Univ. of Guelph, Guelph, Ontario]

Investigations of salmonellae incidence during broiler chicken rearing, processing and retailing are described, with most results reported referring to processing. Incidence of salmonella isolation is tabulated for various sites within processing plants; greatest contamination was at the by-product pit and crate washer, with 34.4 and 29.7%, resp., of samples showing salmonellae. 118 isolates were obtained from 101 salmonella-contaminated birds, from 4240 samples taken in plants (i.e. 2.4% incidence). 22 serotypes were represented in the isolates, the most frequent of which were *Salmonella typhimurium* (21 isolates), *S. senftenberg* (19) and *S. typhimurium* var. *copenhagen* (15). Of 96 carcasses examined at retail, 19.8% were contaminated with salmonellae, the most frequently isolated serotypes being *S. typhimurium* (12 of 29 isolates); 7 serotypes in total were identified. DIH

28

The effect of salt brine chilling on drip loss of ice-packed broiler carcasses.

Carpenter, M. D.; Janky, D. M.; Arafa, A. S.; Oblinger, J. L.; Koburger, J. A.
Poultry Science 58 (2) 369-371 (1979) [16 ref. En] [Florida Agric. Exp. Sta., Univ. of Florida, Gainesville, Florida 32611, USA]

2 trials were conducted to determine effect of salt brine (5% NaCl) chilling of broiler carcasses on water pick-up and subsequent drip loss during storage at 4°C. There was no significant difference in % water pick up of carcasses chilled for 24 h in unagitated 2°C water or salt brine solution held at the same temp. Salt brine-chilled carcasses lost significantly less water during the first 24 h post-chill when compared with water-chilled carcasses. During the 9 days of the study period, the rate of drip loss for the water-chilled carcasses was 0.23% points/day greater than that observed for the brine-chilled carcasses. Thus, the water chilled carcasses had lost 3% more drip than the brine chilled carcasses after 9 days. AS

29

Pyrolytic yields of 2-amino-9H-pyrido[2,3-b]indole and 3-amino-1-methyl-5H-pyrido[4,3-b]indole as mutagens from proteins.

Yoshida, D.; Nishigata, H.; Matsumoto, T.
Agricultural and Biological Chemistry 43 (8) 1769-1770 (1979) [8 ref. En] [Cent. Res. Inst. Japan Tobacco & Salt Public Corp., 6-2 Umegakoka, Midori-ku, Yokohama, Kanagawa 227, Japan]

Yields of the title compounds ((i) and (ii), resp.) in pyrolysates of proteins and protein foods such as chicken meat and horse mackerel were determined. Samples were pyrolysed at 550°C under N₂ for 5 min.

Yields of (i) and (ii) were from chicken meat 34 and 0.04 µg/g and from horse mackerel 12 and 0.02 µg/g. (i) and (ii) have been demonstrated to be mutagenic in a *Salmonella typhimurium* assay. DIH

30

Roast chicken packed more efficiently.

Anon.

Packaging 50 (596) 17-18 (1979) [En]

Sun Valley Poultry Ltd. (Hereford, UK) are packaging roasted chicken portions in expanded polystyrene trays with a PVC film overwrap. The machines (three SP800 stretch-wrappers), produced by the Delford Division of Vacuumatic Ltd., operate at speeds of up to 80 packs/min. HBr

31

Phosphate and heat treatments to control *Salmonella* and reduce spoilage and rancidity on broiler carcasses.

Thomson, J. E.; Bailey, J. S.; Cox, N. A.
Poultry Science 58 (1) 139-143 (1979) [33 ref. En] [USDA, Richard B. Russell Agric. Res. Cent., PO Box 5677, Athens, Georgia 30604, USA]

Broiler chicken carcasses were inoculated with about 300 cells of a naladixic acid resistant strain of *Salmonella typhimurium*, then treated for 3 min with highly agitated water with or without 6% phosphate added, at 65°, 70°, 75°, 80°, 85°, or 90°C. Other broiler carcasses were inoculated with about 60 cells, then similarly treated at 65° or 70°C. All carcasses were chilled after the hot water treatment in a system simulating commercial chilling. When inoculum was 300 cells, at least 5% of the carcasses remained contaminated with *Salmonella*, even when hot water treatment was at 90°C. When inoculum was 60 cells, *Salmonella* were eliminated by hot water treatment at 65° or 70°C. Carcasses showed a partially cooked appearance after hot water treatment. Total bacterial counts on carcasses treated at 70° and 90°C, with or without added phosphate, and then chilled were lower than on control carcasses throughout storage at 2°C for up to 26 days. Phosphates did not consistently or significantly affect either *Salmonella* survival or total bacterial counts. Oxidative deterioration as measured by the thiobarbituric acid test was significantly retarded throughout 26 days of storage by the addition of 6% phosphate to a 70° or 90°C hot water treatment. AS

32

[Accumulation of cholesterol and phospholipids in carcasses of broilers fed on different grain-based rations.]

Krug, Kh.

Doklady TSKhA [Sel'skokhozyaistvennaya Akademiya imeni K. A. Timiryazeva] No. 220, 112-117 (1976) [Ru] [Moskovskaya Sel'skokhoz. Akad. imeni K. A. Timiryazeva, Moscow, USSR]

Groups of male and female chicks were reared to broiler wt. (1200-1700 g) on rations containing resp. a grain mixture, rice, oat grits, millet grits, barley grits, wheat, or maize as main components. Slaughter yields were, resp., 84.9, 84.1, 81.8, 82.1, 82.3, 83.9 and 84.6% for

females, and 84.9, 85.0, 81.6, 83.0, 82.2, 83.5 and 84.8 for males. In organoleptic assessment, broth and meat of broilers given rice or maize were scored best, while meat of broilers given barley grits, and broth from broilers given mixed grain or millet grits received the lowest scores. At 70 days of age, chickens given wheat or maize showed the lowest carcass contents of cholesterol, but there were no evident trends in phospholipid contents; contents of total fat were lowest on barley grits, wheat and maize. SKK

33

[Effect of technical grade animal fat and vegetable oil on amino acid deposition in broiler carcasses.]

Bakanov, V. N.; Aleksandrov, V. A.; Khlystova, L. F. *Doklady TSKhA [Sel'skokhozyaistvennaya Akademiya imeni K. A. Timiryazeva]* No. 220, 106-111 (1976) [Ru] [Moskovskaya Sel'skokhoz. Akad. imeni K. A. Timiryazeva, Moscow, USSR]

6 of 9 groups of 45 Cornish chicks received, from 1 day of age, compound balanced rations containing resp. 2, 6.5 or 7.0% sunflower seed oil or 2, 6.5 or 7.0% technical grade animal fat; the remaining 3 groups served as controls. 3 chicks from each group were slaughtered at 75 days of age and whole carcasses (including feathers) were analysed. It is concluded from mean values tabulated for contents of moisture, protein, fat and 11 amino acids that addition of animal fat or vegetable oil to the rations had no effect on contents of protein or amino acids in the carcass, but increased deposition of fat. SKK

34

Processing and grading of ready-to-cook chicken. Sunararasu, V.

Poultry Guide 16 (7) 54-58 (1979) [En] [Madras Vet. Coll., Madras, Tamilnadu, India]

17 steps that are taken in the processing of ready-to-cook chicken, 6 steps taken in grading them, and a summary of the USDA specifications for chickens of grades A, B, & C are reported. CFTRI

35

New marketable chicken products.

Rao, V. A.

Poultry Guide 16 (3) 41-48 (1979) [En] [Cent. Training Inst. for Poultry Production & Management, Hessarghatta-562 113, Bangalore, India]

Recipes are given for various chicken products, including chicken sausages (frankfurters and bologna), tandoori chicken, chicken a la king, sandwich spread, broth, fricasee, poultry rolls, steaks and boneless roasts. CFTRI

36

[Ethococcid persistence time.]

Adamska, T.; Jodynys-Liebert, J.; Senczuk, W.; Zielinska-Psuja, B.

Roczniki Panstwowego Zakladu Higieny 30 (2)

109-114 (1979) [11 ref. Pl, en] [Zaklad Chem.

Toksykologicznej Inst. Chemi i Analizy Akad. Med., Poznan, Poland]

Tests on White Rock chickens indicated that, after both prophylactic and therapeutic doses of the anticoccidiosis drug Ethococcid, only trace amounts of its components (i) Amprolium and (ii) Ethopabate could be found in tissues of the slaughtered birds, and then only immediately after administration. It is concluded that these compounds do not accumulate in chicken tissue. Conc'n. of 3-13 and 1-5 µg/g (i) and (ii) resp. (depending on the organ studied) could be determined by colorimetry. [From En summ.] HBr

37

Sodium nitrite and sorbic acid effects on *Clostridium botulinum* spore germination and total microbial growth in chicken frankfurter emulsions during temperature abuse.

Sofos, J. N.; Busta, F. F.; Allen, C. E.

Applied and Environmental Microbiology 37 (6) 1103-1109 (1979) [24 ref. En] [Dep. of Food Sci. & Nutr., Univ. of Minnesota, St. Paul, Minnesota 55108, USA]

Samples of (i) a control or of (ii) sodium nitrite-containing or (iii) sorbic acid-containing, mechanically deboned chicken meat frankfurter-type emulsion inoculated with *Clostridium botulinum* spores, or a combination of (ii) and (iii), were temp. abused at 27°C. Spore germination and total microbial growth were followed and examined at specified times and until toxic samples were detected. The spores germinated within 3 days in both control and nitrite (20, 40, and 156 µg/g) treatments. Sorbic acid (0.2%) alone or in combination with nitrite (20, 40, and 156 µg/g) significantly ($P < 0.05$) inhibited spore germination. No significant germination was recorded until toxic samples were detected. A much longer incubation period was necessary for toxin to be formed in nitrite-sorbic acid combination treatments as contrasted with controls or nitrite and sorbic acid used individually. Total growth was not affected by the presence of nitrite, whereas sorbic acid appeared to depress it. Possible mechanisms explaining the effects of nitrite and sorbic acid on spore germination and growth are postulated. AS

38

Effects of dietary fatty acids on the accumulation of lipids in the liver of growing chicks.

Tanaka, K.; Akazaki, N.; Collado, C. M.; Ohtani, S.; Shigeno, K.

Japanese Journal of Zootechnical Science [Nihon Chikusan Gakkai-ho] 50 (8) 563-573 (1979) [41 ref. En, ja] [Fac. of Agric., Gifu Univ., Kakamigahara-shi 504, Japan]

Groups of Single Comb White Leghorn (SCWL) and meat-type chicks were used in studies on effects of dietary essential fatty acids on accumulation of lipids in the liver, liver metabolism and abdominal fat wt. 3 diets were tested: (i) containing 8% safflower oil; (ii) deficient in essential acids and containing 8% coconut oil; and (iii) a fat-free diet deficient in essential fatty acids. The chicks were slaughtered at 9 wk of age. Abdominal fat contents of carcasses of SCWL chicks were (g/100 g body wt): (i) 0.3, (ii) 0.3 and (iii) 0.4. Corresponding values for meat-type chicks were: 0.3, 0.4 and 0.3, differences not being significant. Liver wt. of SCWL,

chicks were (g/100 g body wt.); (i) 2.0, (ii) 2.2 and (iii) 2.4 (differences not significant). Corresponding values for meat-type chicks were 2.6, 3.8 and 4.0 g/100 g body wt., (ii) and (iii) being significantly higher than (i). Diets (ii) and (iii) significantly increased levels of triglycerides and total cholesterol and decreased concn. of phospholipids in the liver as compared to (i), in both SCWL and meat-type chicks. AJDW

39

The accumulation and elimination of tissue residues after feeding pentachloronitrobenzene to White Leghorn cockerels.

Dunn, J. S.; Booth, N. H.; Bush, P. B.; Farrell, R. L.; Thomason, D.; Goetsch, D. D.

Poultry Science 57 (6) 1533-1538 (1978) [16 ref. En] [Dep. of Agric. PO Box 703, Univ. Sta., Southeastern Louisiana Univ. Hammond, Louisiana 70402, USA]

Day-old White Leghorn cockerels were fed graded levels (10, 50, 100, and 1000 p.p.m.) of pentachloronitrobenzene (PCNB) containing pentachlorobenzene (PCB), tetrachloronitrobenzene (TCNB), and hexachlorobenzene (HCB) as trace contaminants, for 12 wk. Bioaccumulation of PCNB and its metabolites in tissues does not appear to occur to any major extent. The contaminants of PCNB, HCB, and PCB were found to accumulate to a greater degree in adipose tissue than does PCNB itself. TCNB was also detected in adipose tissue and in trace amounts in other tissues. PCNB accumulated to the highest concn. in body fat followed by gizzard and kidney. Only traces of PCNB were found in heart, liver, leg, and heart muscle. Metabolites, pentachloroaniline (PCA), and pentachlorophenylmethylsulphide (PCMS) were found in only trace quantities following the feeding of 1000 p.p.m. PCNB. Half-life values for the depletion of the contaminants of PCNB, PCB, and HCB were determined in adipose tissue of cockerels; values as high as 53 and 95 days were found for PCB and HCB, resp. AS

40

Role of phospholipids and triglycerides in warmed-over flavor development in meat model systems.

Igene, J. O.; Pearson, A. M.

Journal of Food Science 44 (5) 1285-1290 (1979) [36 ref. En] [Dep. of Food Sci. & Human Nutr., Michigan State Univ., East Lansing, Michigan 48824, USA]

The effects of triglycerides and phospholipids on development of warmed-over flour (WOF) in cooked meat was studied using model systems from beef and from chicken dark and light meat. Triglycerides, total lipids, total phospholipids, phosphatidyl choline (PC) and phosphatidyl ethanolamine (PE) were added back to the lipid extracted muscle fibres in each system and WOF development was followed by the thiobarbituric acid (TBA) test and taste panel scores after heating to 70°C and holding at 4°C for 48 h. Total phospholipids, especially PE, were shown to be the major contributors to development of WOF in cooked meat. Triglycerides enhanced development of WOF only when combined with phospholipids (as total lipids). PC did not influence WOF in the model system. Changes in the polyunsaturated fatty acids of the phospholipids were

shown to be related to development of WOF in cooked meat. Addition of 156 p.p.m. of nitrite significantly ($P < 0.01$) reduced TBA numbers and prevented development of WOF. IFT

41

Factors affecting quality, yields, and consumer acceptance of broiler halves.

Health, J. L.

Poultry Science 58 (2) 350-354 (1979) [12 ref. En] [Dep. of Poultry Sci., Univ. of Maryland, College Park, Maryland 20742, USA]

3 experiments were conducted to evaluate methods of producing broiler halves and determine the effects of these methods on quality and yield parameters. Halves were made by either splitting or removing the backbone prior to chilling using standard techniques and conditions. No difference in water pickup during chilling, thawing losses, or cooking losses could be attributed to splitting or removal of the backbone. Effect of aging (2 h chill, 22 h ice pack, and 2 h chill) before cutting was compared to aging (23°C for 2 h) before or after cutting. No difference was found in water pickup when the 2 chilling treatments were compared. Cooking the halves produced no difference in total cooking losses when the 4 treatments were compared. The 2 h chill, 22 h crushed ice treatment had larger drip and less volatile losses than the other treatments. Shear press values indicated no difference in tenderness when the 2 chilling methods or the 2 hot-cutting methods were compared. The halves hot-cut and aged for 2 h at 23°C were tougher than halves the two chilling treatments. Carcasses chilled before and after cutting into halves were compared to hot-cut, unchilled halves. Chilling for 2 h before or after halving produced no differences in cooking losses. Halves cooked immediately after hot-cutting had less total and volatile cooking losses than halves chilled before or after halving and less drip loss than those chilled prior to halving. Breast muscle from halves chilled for 2 h before halving were more tender than the other treatments. Breast muscle from the halves chilled after hot-cutting was redder than the other 2 treatments. Although no differences in water content was found when the 2 chilled treatments were compared, unchilled halves had more water in the leg tissue than the chilled halves. No differences in fat content of either breast or leg samples were found attributable to treatment. AS

42

Effect of freezing and marginal finish differences on the preparation of chicken broiler carcasses by pressurized deep-fat frying.

Moran, E. T., Jr.

Poultry Science 58 (2) 355-360 (1979) [20 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada N1G 2W1]

Commercial source broiler chicken carcasses were selected from the "drop-out" range (1300 ± 25 g) immediate to chilling regardless of strain, sex, and age. Selection required that all carcasses be in the "A" category for conformation and fleshing but specifically of either A— or B+ for finish. Half of the carcasses comprising each finish grade were subsequently either

held bagged on ice for 52 h or frozen in shrinkable film bags (-30°C) for 34 h and defrosted for 18 h at 14°C . Preparation for cooking involved separation and trimming to "9 piece cut", hot water rinse, egg-white dip and seasoned flour coating. Cooking used a pressurized deep-fat frying unit operating at 190°C and 1 kg/cm^2 for 11 min. Each cooking cycle prepared the parts from 4 carcasses which were represented by the 4 treatments with 20 cycles constituting the experiment. Composite losses incurred from initial chilled wt. to raw ready-to-cook parts was greater if the carcass had been frozen than held fresh but unaltered by a finish difference. No differences in gain due to coating, cooking loss, and yield of total carcass or its components occurred which could be attributed to the experimental variables except for thigh. Cooking loss and sample moisture content of thigh was decreased by earlier freezing. All alterations in total were small and of questionable impact on product quality. AS

43

Effect of addition of polyphosphates and salt before and after cooking on quality of freeze-dried cooked chicken.

Klose, A. A.; Lyon, B. G.; Day, W. D.

Poultry Science 57 (6) 1573–1578 (1978) [8 ref. En] [Anim. Products Composition & Utilization Res. Unit, USDA, Richard B. Russell Agric. Res. Cent., Athens, Georgia 30604, USA]

2 processing experiments were run to evaluate the effects of polyphosphates (Kena) and NaCl added to broiler breast meat on the yields, rehydration capacity, and sensory quality of the freeze-dried cooked, diced meat. In Experiment A, early post mortem breast meat was treated with a solution of 3% Kena–4% NaCl either before cooking, after cooking, or both. In Experiment B, chilled, aged breast meat was treated with 2% NaCl, 3% Kena, or both before cooking and freeze-drying. In Experiment A, polyphosphate-salt treatment increased water uptake, cooked yield, and final rehydrated wt., and increased sensory qualities of juiciness, tenderness, and saltiness. For a single treatment, its application after cooking was as effective as that before cooking. For Experiment B, the same effects were observed, the 3% Kena producing the major impact and the 2% NaCl having small additional effects. Polyphosphate (Kena) treatment improved the eating quality of the freeze-dried product. AS

44

Effect of frozen storage time, cooking and holding temperature upon extractable lipids and TBA values of beef and chicken.

Igene, J. O.; Pearson, A. M.; Merkel, R. A.; Coleman, T. H.

Journal of Animal Science 49 (3) 701–707 (1979) [26 ref. En] [Dep. of Food Sci. & Human Nutr., Michigan State Univ., East Lansing, Michigan, USA]

The stability of frozen meat (mainly a function of lipids content) was studied with cuts of fresh beef, chicken dark and chicken white meats which were frozen and stored at -18°C for up to 13 months. Samples were taken after 0, 8 and 13 months of frozen storage for measurement of lipid composition and TBA

numbers (malonaldehyde). Portions of the above raw frozen meats were also cooked and then held at either 4° or -18°C for 48 h and subjected to the same analyses. With raw meat, losses in the triglyceride fraction produced changes in total lipids during frozen storage, but phospholipid content remained relatively constant. Cooking increased the % phospholipids in relation to total lipids and increased lipid oxidation. Cooked meat held for 48 h was more susceptible to off-flavour development at 4°C than at -18°C ; the former temp. is not recommended for frozen, cooked meat. The order of stability was beef > white chicken meat > dark chicken meat. ELC

45

[Use of poultry meat for sausage manufacture.] Choroszucho, A.

Gospodarka Miesna 30 (11) 21–22 (1978) [Pl]

A brief, general survey of the use of poultry meat for sausage manufacture is given. Sausages made with medium-ground poultry meat up to 40% of the total raw materials have been found to give satisfactory organoleptic properties. Broiler meat is particularly suited for production of dietetic sausages. HBr

46

[Use of fumaric acid in rations for broilers.] Der Einsatz von Fumarsäure im Alleinfuttfür Masthühnerküken (Broiler).

Vogt, H.; Matthes, S.; Harnisch, S.; Ristic, M.

Archiv für Geflügelkunde 43 (2) 54–60 (1979) [6 ref.

De, en, fr, ru] [Inst. für Kleintierzucht, Bundesforschungsanstalt für Landwirtschaft, Braunschweig-Völkenrode, Celle, Federal Republic of Germany]

768 Lohmann broiler chicks (1 day of age at the start of the investigation) were used in each of 3 feeding trials on effects of addition of fumaric acid to the diet on performance and carcass quality. Dietary fumaric acid levels of $\leq 8\%$ were used; the broilers were slaughtered at 7 wk of age. Tables of results are given, including data for carcass wt., pH, colour lightness, rigor value, breast meat colour, peroxide value of abdominal fat, organoleptic properties, grilling loss, and objectively-measured tenderness. Significant differences were observed for most of the characteristics studied; however, variations were generally not closely related to differences in dietary fumaric acid concn. Addition of 1–4% fumaric acid to the diet decreases grilling losses and organoleptic quality scores. AJDW

47

[Meat yield in three chicken hybrids.]

Vukic, M.; Ciric, D.

Arhiv za Poljoprivredne Nauke 31 (115) 137–143 (1978) [11 ref. Sh, en] [Poljoprivredne Fak., Novi Sad, Yugoslavia]

The carcass characteristics (including dressing %, usable giblets, fat, drumsticks and legs, breast) of Hybro, Hubbard and Ross chickens are tabulated. Overall, no noteworthy differences between the 3 hybrids were observed. HBr

48

Influence of rapessed meal on the eating quality of chicken. I. Subjective evaluation by a trained taste panel and objective measurements.

Steedman, C. D.; Hawrysh, Z. J.; Hardin, R. T.; Robblee, A. R.

Poultry Science 58 (1) 148-155 (1979) [26 ref. En] [Foods & Nutr. Div., Fac. of Home Economics, Univ. of Alberta, Edmonton, Alberta, Canada T6G 2M8]

White Mountain × Hubbard broiler chickens were fed 1 of 4 rations: (i) a soybean meal control ration; (ii) soybean meal ration with a high fat and fibre content, (iii) a 15% Span rapeseed meal ration; (iv) a 15% Span rapeseed meal ration with 5% herring meal, 0.1% DL-methionine, and 0.05% choline chloride. At 8 wk of age, chickens from each treatment were commercially killed, eviscerated, and assigned to one of 3 storage periods: fresh, or 18 days or 6 months frozen storage. Cooked light and dark meat and broth samples were evaluated subjectively. Objective measurements were also made. Results indicate that: feeding (iv) caused significantly lower scores for odour, flavour, and overall acceptability of light and dark chicken meat and broth than the other 3 rations; (ii) resulted in significantly lower flavour and overall acceptability scores for dark meat and flavour scores for broth than (i); tenderness scores for light and dark meat from chickens fed (iv) were significantly lower than tenderness scores for comparable samples from (i) chickens; however, shear force values were not significantly affected by ration; there were no significant differences in juiciness attributable to ration (taste panel data) and water holding capacity (WHC); trained panelists indicated that, except for odour scores for light meat, dark meat, and broth samples and juiciness scores for light meat samples, eating quality was not affected by frozen storage; light meat from chickens held frozen for 6 months required less shear force than that from fresh or short frozen chickens; and WHC of frozen chickens stored 6 months was significantly lower than WHC of fresh chickens. [See following abstr. for part II.] AS

49

Influence of rapeseed meal on the eating quality of chicken. II. Subjective evaluation by a consumer taste panel.

Steedman, C. D.; Hawrysh, Z. J.; Hardin, R. T.; Robblee, A. R.

Poultry Science 58 (2) 337-340 (1979) [9 ref. En] [Foods & Nutr. Div., Fac. of Home Economics, Univ. of Alberta, Edmonton, Alberta, Canada T6G 2M8]

Eating quality of 8 wk old White Mountain × Hubbard broiler chickens fed 3 commercial-type rations was evaluated by 144 consumer households. The rations were: (i) soybean meal control ration; (ii) a 15% Span rapeseed meal ration, and (iii) a 15% Span rapeseed meal ration with 5% herring meal, 0.1% methionine, and 0.05% choline chloride. Consumers received 3 coded frozen half-chickens (one representing each ration treatment) and cooked each defrosted chicken half, scored the odour, flavour, and overall acceptability of the chickens using a 5-point hedonic scale, and ranked the chickens in order of preference. Subjective evaluation by the consumers indicated that chickens fed

the (iii) received significantly lower odour, flavour, and overall acceptability scores than chickens fed either (i) or (ii). Chickens representing (ii) received slightly lower palatability scores than (i) chickens, but the differences were not significant. Preference ratings indicate that chickens fed (iii) were rated 'least preferred' more frequently ($P < 0.05$) than chickens fed either (i) or (ii) which received similar ratings. These findings suggest that the eating quality of chickens was adversely affected by (iii). Inclusion of 15% Span rapeseed meal in (ii) resulted in chicken which was judged acceptable in eating quality. [See preceding abstr. for part I.] AS

50

Raw and autoclaved fababeans (*Vicia faba* L.) as an alternate source of protein for broilers.

Bhargava, K. K.; O'Neil, J. B.

Canadian Journal of Animal Science 59 (3) 531-537 (1979) [many ref. En, fr] [Res. Dep., Cawfords Foods Ltd., Wynyard, Saskatchewan S0A 4T0, Canada]

In experiments on the role of fababeans in broiler chick diets, 1 experiment was conducted over an 8-wk period to ascertain the carcass value of chicks fed isocaloric and isonitrogenous diets, containing up to 72% fababeans, to 55 days of age. Results are presented in a graph for eviscerated meat ratio of the chicks: carcass grades of birds were similar at all levels of beans fed. SP

51

["Ruse" chicken and mushroom paste.]

Bulgaria, D'rzhaven Komitet za Standardizatsiya
Bulgarian Standard BDS 14597-78, 4pp. (1978) [Bg]

This standard applies to a canned paste made from chicken, cultivated mushrooms, sunflower seed oil and additives (spices). Specific requirements include: moisture content, $\leq 70\%$; fat, 13-18%; salt, 0.8-1.5%; total ash, $\leq 2.5\%$; acid-insoluble ash, $\leq 0.05\%$; Cu, Sn and Pb salts, ≤ 10 , ≤ 100 and ≤ 0.3 mg/kg, resp.; there is no tolerance for pathogens, anaerobes, sporeformers, moulds or saprophytic aerobic sporeformers. The product shall be stored at $\leq 15^\circ\text{C}$; guaranteed shelf life is 1 yr from date of manufacture. HBr

52

[Coagulase types of *Staphylococcus aureus* from food poisoning outbreaks and types of incriminated foods.]

Terayama, T.; Ushioda, H.; Shingaki, M.; Inaba, M.; Kai, A.; Sakai, S.

Annual Report of Tokyo Metropolitan Research Laboratory of Public Health 28 (1) 1-4 (1977) [12 ref. Ja, en] [Tokyo Metropolitan Res. Lab. of Public Health 24-1, Hyakunincho 3 chome, Shinjuku-ku, Tokyo, 160 Japan]

During 1967-1976, a total of 347 outbreaks of staphylococcal food poisoning was reported in Tokyo. 188 outbreaks were confirmed serologically in the authors' laboratory, as those outbreaks showed complete agreement on the coagulase types of the isolates both from incriminated foods and from patients. As regards coagulase types of the causal *S. aureus*, 35 outbreaks were proved to be caused by type II organisms, 36 outbreaks by type III, 26 by type VI and

91 by type VII. However, none of the causal isolates belonged to coagulase types I, IV, V or VIII. Since 1971, food poisoning outbreaks caused by type VII organisms have been increasing gradually. Incriminated foods in 141 (75.0%) outbreaks were found to be typical Japanese style processed foods which were mainly composed of rice, i.e., 62 (33.0%) outbreaks by delivered luncheon with rice, 52 (27.7%) by Nigirimeshi (rice ball), and 16 (8.5%) by Sushi [rice with fish] and 11 (5.9%) by Japanese cake, as well as 13 (6.9%) by bread, 5 (2.7%) by roast chicken and 14 (7.4%) miscellaneous other foods. AS

53

Determination of leptophos residues in poultry. Tantawy, G.; Othman, M. A. S.; Abou-Donia, M. B.; Marei, A. S.; Khalil, A. Z. *Alexandria Journal of Agricultural Research* 26 (3) 721-730 (1978) [12 ref. En, ar] [Dep. of Plant Protection, Fac. of Agric., Univ. of Alexandria, Alexandria, Egypt]

Residual leptophos, its O-analogue and its phenolic decomposition product were determined in body tissues, egg yolk and egg white of hens given a single oral dose of 200 mg/kg, 1 to 17 days prior to slaughter or collection. Levels of the parent compound in breast and thigh muscles reached max. of 4.12 and 2.86 p.p.m., resp. 9 days after administration, while levels in depot fat reached a max. of 1.72 p.p.m. after 5 days. Residues of leptophos and its metabolites in egg contents reached a peak at the fifth day after administration, at 7.31, 16.81 and 23.98 p.p.m. for the phenolic product, the O-analogue and leptophos itself, resp. in egg yolk, and 28.95 p.p.m. leptophos in egg white. JRR

54

[Effects of treatment with various hormones and pregnant women's urine on egg laying and meat production of two-year-old hens.]

Kim, S. K.; Lee, K. D.; Lee, D. S. *Korean Journal of Animal Science* 21 (4) 307-319 (1979) [44 ref. Ko, en] [Taejon Vocational Col., Taejon, S. Korea]

2-yr old hens were treated with (i) pregnant mare serum gonadotrophin, (ii) human chorionic gonadotrophin, (iii) thyroxin, (iv) tapazole, (v) oestrogen, (vi) progesterone and (vii) pregnant women's urine and effects of (i)-(vii) on egg and meat quality were studied in comparison with (viii) a control. Results are tabulated and show there was no significant difference between treatments for egg wt. There was no significant difference between (i), (v), (vii) and (viii) for yolk number, but (ii) (iii), (iv) and (vi) were significantly different ($P < 0.01$) from each other and all other treatments. A significant difference ($P < 0.05$) was noted in carcass wt. among the treated groups and the carcass wt. of (i), (ii), (iv), (v) and (vii) was higher than of (viii). The carcass % of (i) and (iv) was significantly higher than that of (viii), there was no significant difference between (ii), (iii), (v), (vi), (vii) and (viii). The water extractives, moisture and ash contents of meat were not affected by the treatments, however crude protein content of meat was slightly lower in (iii) and (iv) and slightly higher in (i), (v) and (vi) compared to (viii) and

crude fat content was higher in (iv) than (viii). Heart and liver wt. of (i)-(viii) were in proportion to body wt. [From En summ.] SP

55

A study of the excretion and tissue distribution in cattle and chickens fed carbon-14 labeled avoparcin lauryl sulfate.

Zulalian, J.; Lee, A. H.; Garces, T.; Berger, H.; Orloski, E. J.; Eggert, R. G.

Abstracts of Papers, American Chemical Society 177 (2) PEST 114 (1979) [En] [Agric. Res. Div., American Cyanamid Co., Princeton, New Jersey 08540, USA]

Avoparcin is a glycopeptide antibiotic obtained from cultures of *Streptomyces candidus* and is being developed for use as an animal growth promoter. Metabolism studies were conducted in cattle and chickens with [^{14}C] avoparcin lauryl sulphate to determine the routes and rates of excretion and tissue residues. The antibiotic was fed to steers for 8 consecutive days at 2 mg/kg and to chickens for 7 consecutive days at 1 mg/kg. In the study with steers, virtually the entire dose was accounted for in faeces and gastrointestinal contents; $< 0.2\%$ of the dose was in the urine. In the study with chickens, virtually the entire dose was in the combined urine-faecal samples and the gastrointestinal contents. A method was developed using radiotracer techniques, sensitive to 0.05 p.p.m., to measure ^{14}C residues in the tissues. In the cattle study, residues in fat, liver and muscle were < 0.05 p.p.m. and in the kidney the residues were between 0.05 and 0.06 p.p.m. In the chicken study, the residues in all tissues were < 0.05 p.p.m. Based on these data, it was concluded that essentially no avoparcin or radioactivity derived therefrom was absorbed from the gastrointestinal tract of the animals. AS

56

Effect of carcass rinse volumes and incubation conditions on recovery of *Salmonella typhimurium* from broilers.

Mercuri, A. J.; Cox, N. A.

Abstracts of the Annual Meeting of the American Society for Microbiology 79, 218 (1979) [En] [USDA, Russel Res. Cent., Athens, Georgia, USA]

Direct enrichment of carcass rinse fluid with selenite cystine (SC) was effective in detecting low levels of salmonellae on broiler chickens. Experiments were conducted to determine if different rinse vol. and/or incubation conditions would result in more rapid detection of salmonellae in enrichment cultures. Broiler carcasses inoculated with 10^1 — 10^2 cells of a nalidixic acid-resistant *S. typhimurium* were rinsed with 100, 200 or 300 ml of sterile water to which conc. ($10\times$) SC was added. Equal numbers of the enriched samples were incubated in air, or in water, at 37°C and 43°C . At intervals between 4 and 24 h, loopfuls of the cultures were streaked onto MacConkey's agar containing 100 p.p.m. nalidixic acid. In air, the min. incubation period (MIP) required to detect the marker organism in all enriched cultures was between 8 and 10 h. Before 8 h, significantly more positives ($P = 0.01$) were detected at 43° than at 37°C , and with 100 or 200 than with 300 ml rinse samples. In water, the MIP was between 6 and 8 h, and there were no differences in the number of positives

between 37° and 43°C or between 100 and 300 ml rinse samples before 6 h. Agitation during water bath incubation did not reduce the time required for detection of the marker organism. AS

57

[Physico-chemical properties of smoked chicken.]

Onogi, T.; Toyoda, M.

Journal of Japanese Society of Food Science and Technology [Nippon Shokuhin Kogyo Gakkaishi] 25 (3) 158-161 (1978) [7 ref. Ja, en] [Agric. Management Acad. of Yamagata Prefecture, Shinjo-shi, Yamagata, Japan]

Physico-chemical properties of smoke-cured meat from White Leghorn (10 months old) and Rhode Island Red hens (10 and 20 months old) were compared. So far as pH, moisture, soluble N content, thiobarbituric acid (TBA) value and contents of free amino acids in soluble N were concerned, little variation was observed among samples. Contrary to this, proteose-peptone N content of Rhode Island Red samples and VBN content of the 20 months old hens were a little lower than in the other samples. Texture of the smoked meat was measured by texturometer; smoke-cured leg meat of Rhode Island Red hens (20 months old) showed the highest hardness value. AS

58

Emulsifying characteristics and composition of mechanically deboned chicken necks and backs from different sources.

Orr, H. L.; Wogar, W. G.

Poultry Science 58 (3) 577-579 (1979) [7 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada N1G 2W1]

Commercially prepared mechanically deboned poultry meat (MDPM) was obtained from 2 different deboning machines using chicken necks and backs from different sources. Emulsifying characteristics and composition were determined on fresh and frozen samples of MDPM. Source of raw material was found to produce MDPM which differed significantly in emulsifying capacity, water holding capacity, emulsion stability, and % fat and moisture. Freezing and storage lowered the emulsifying capacity, water holding capacity, emulsion stability, and % moisture. It appears that source of necks and backs may have a greater influence on the emulsifying characteristics and composition than the deboning machine used. AS

59

[Effects of transport and of holding before slaughter on meat quality and biochemical characteristics of broilers.] Einfluss von Transport und Wartezeiten vor dem Schlachten auf Fleischqualität und biochemische Merkmale bei Broilern.

Gschwindt, B.; Ehinger, F.

Archiv für Geflügelkunde 43 (2) 78-82 (1979) [25 ref. De, en, fr, ru] [Lehrstuhl Kleintierzucht, Univ. Hohenheim, 7000 Stuttgart 70, Federal Republic of Germany]

8 wk old broilers were used in a study on effects of duration of holding in transport crates before slaughter

on carcass quality and biochemical characteristics. The birds (10/crate) were transported for 45 min; 45 crates were then stacked, 5 crates high, at the slaughterhouse. Batches of broilers were slaughtered after holding for 0, 1, 2, 3, or 4 h in the stack of crates. Tables and graphs of results are given. Wt. loss of the birds increased with increasing holding time, to a max. of 3.75% after 4 h. Tenderness of breast meat of birds held for 1-4 h was inferior to that of control birds; thigh meat tenderness was poorer for birds held for 3 h than for the other groups. Uptake of extraneous water was greatest for the group not held before slaughter, and lowest for the group held for 3 h. Cooking losses and loosely-bound water content were not significantly influenced by holding before slaughter. Correlations between the carcass characteristics studied are given. Data are also given for the haematocrit and serum biochemical characteristics of the birds. AJDW

60

[Dependence of storage characteristics of broilers on storage time before and after cutting.] Abhängigkeit der Lagerfähigkeit bei Broilern von der Lagerdauer vor und nach der Zerlegung.

Ristic, M.

Archiv für Geflügelkunde 43 (2) 83-86 (1979) [7 ref. De, en, fr, ru] [Bundesanstalt für Fleischforschung, Kulmbach, Federal Republic of Germany]

320 Lohmann broiler carcasses were stored at -18°C for 0-3 months before cutting, thawed for 38 h at 4°C, cut into chicken pieces, re-frozen and stored for 1-4 months at either -12° or -18°C. At monthly intervals during storage of poultry pieces, the pH, colour lightness, rigor value, % drip loss, smell, colour, peroxide value and aldehyde value were determined. Tables of results are given, together with statistical analyses of the results. The results are discussed in detail, with reference to the potential storage life, and the significance of duration of pre-cutting storage and the duration and temp. of post-cutting storage and the duration and temp. of post-cutting storage for changes in the individual quality indices studied. Assuming storage for 3 months at -18°C before cutting, the subsequent storage life of the chicken parts was 3 months at -12°C or 4 months at -8°C. AJDW

61

The role of nitrite in preventing development of warmed-over flavour.

Fooladi, M. H.; Pearson, A. M.; Coleman, T. H.; Merkel, R. A.

Food Chemistry 4 (4) 283-292 (1979) [18 ref. En] [Michigan State Univ., E. Lansing, Michigan 48824, USA]

Development of warmed-over flavour (WOF) was followed in samples of beef, pork, and chicken with and without added NO₂⁻ (156 p.p.m.). Samples were evaluated by the 2-thiobarbituric acid (TBA) test and by sensory panel scores before and after cooking, and after 48 h at 4°C. Added NO₂⁻ inhibited WOF development in raw beef and chicken and in cooked meat, resulting in a 2-fold reduction in TBA values for cooked beef and chicken and a 5-fold reduction in pork. Sensory panel scores confirmed the protective effect of added NO₂⁻ in

meat from all 3 spp. Total lipid levels were not significantly related to WOF, but there was evidence for involvement of phospholipids. AS

62

[Histochemical and histological investigations on the *pectoralis superficialis* muscle with accelerated, normal and delayed glycolysis rate in broilers.]

Histochemische und histologische Untersuchungen am *M. pectoralis superficialis* mit beschleunigter, normaler und verzögerter Glykolyserate in Broilern. Klosowska, D.; Niewiarowicz, A.; Klosowski, B.; Trojan, M.

Fleischwirtschaft 59 (7) 1004-1008 (1979) [36 ref. De, en] [Acad. of Agric., ulica Wojska Polskiego 31, 60-624 Poznan, Poland]

Histological and histochemical investigations were done on the *pectoralis superficialis* muscle from 106 broilers divided into 3 groups by the pH in the breast muscle 15 min after slaughter: pH₁ 5.6-5.8 (accelerated glycolysis), 5.9-6.2 (normal glycolysis), or 6.4-6.6 (delayed glycolysis post mortem). Detn. of the water-holding capacity, thermal drip and Hart's test value showed markedly decreased meat quality in the lowest pH₁ group, typical of PSE (pale, soft, exudative). The meat with highest pH₁ also showed decreased technological properties. The muscles with accelerated glycolysis had many fibres with increased succinic dehydrogenase and myoglobin peroxidase activity, and reduced phosphorylase activity, a higher % of giant fibres (compared with PSE pork), more frequent necrotic changes, variations in muscle fibres size and lymphatic infiltration than the other 2 groups. While these characteristics are symptoms of muscular dystrophy, they were also found in some normal muscles, and not in all PSE and DFD (dark, firm, dry) muscles, and did not allow attribution of decreased technological meat quality to muscular dystrophy. [From En summ.] RM

63

Tissue residues from feeding pentachloronitrobenzene to broiler chickens.

Reed, D. L.; Bush, P. B.; Booth, N. H.; Kiker, J. T.; Goetsch, D. D.; Farrell, R. L.

Toxicology and Applied Pharmacology 42 (2) 433-441 (1977) [17 ref. En] [Physiology & Pharmacology Dep., Univ. of Georgia, Athens, Georgia 30602, USA]

The fungicide pentachloronitrobenzene (PCNB) is used extensively as a soil and seed treatment for various crops including cereals and cotton; since cereal grains and cottonseed meal are major components of animal feeds, it is essential to identify what effects PCNB has when it enters the plant-animal food chain. Male broiler chicks (Hubbard-Hubbard) were fed 0-20 p.p.m. agricultural grade PCNB for ≤ 8 wk; analysis of the PCNB indicated that it is contained 0.6% hexachlorobenzene (HCB) as a contaminant. All birds remained healthy and no treatment-related changes were observed in body wt. or organ wt. Histopathological examination of various organs failed to reveal lesions in either control or PCNB-treated birds. Traces of PCNB and its major metabolite (pentachloroaniline) were occasionally found at levels

approaching the detectability limit (0.01 p.p.m.) in the organs but not in the adipose tissue. HCB accumulated in adipose tissue to a level 25-50 times greater than that found in the feed. HCB was also consistently found in body tissues during the withdrawal phase of the study; even 5 wk after withdrawal of PCNB from the diet, HCB levels > 0.5 p.p.m. persisted in the fat of birds fed 20 p.p.m. PCNB. JA

64

Residues of Phosvel in plasma and in adipose tissue of hens after single oral administration.

Konno, N.; Kinebuchi, H.

Toxicology and Applied Pharmacology 45 (2) 541-547 (1978) [17 ref. En] [Dep. of Public Health, Fukushima Med. Coll., Fukushima, Japan]

Phosvel [*O*-(4-bromo-2,5-dichlorophenyl)-*O*-methylphenylphosphonothionate] is an organophosphorus pesticide known to produce delayed neurotoxic effects in hens. Hens (24 months old) were sacrificed 1-72 h after receiving a single oral dose of 50 or 250 mg Phosvel/kg body wt. With both doses, the Phosvel concn. in plasma reached a max. within 3 h of dosing and then declined rapidly, none being detected after 72 h. The Phosvel concn. in fat reached a peak 12 h after dosing with both doses; the concn. found was closely related to the dose given. Phosvel elimination from the fat was very slow, mean levels found, 1, 12 and 72 h after dosing being, resp., 0.15, 2.53 and 1.17 p.p.m. with the 50 mg/kg dose and 0.74, 8.60 and 8.03 p.p.m. with the 250 mg/kg dose. In a 2nd study, hens (6 and 21 months old) were given a single oral dose of 250 mg Phosvel/kg and sacrificed 1-28 days after dosing. The level of Phosvel in the fat of the younger birds declined to ≤ 0.09 p.p.m. after 21 days and to an undetectable level after 28 days; corresponding levels in the older birds were 0.28-1.27 p.p.m. after 21 days and ≤ 0.13 p.p.m. after 28 days. Delayed neurotoxic effects were found in the older birds but not in the younger. JA

65

Excretion and tissue distribution of radioactivity from tritium-labeled T-2 toxin in chicks.

Chi, M. S.; Robison, T. S.; Mirocha, C. J.; Swanson, S. P.; Shimoda, W.

Toxicology and Applied Pharmacology 45 (2) 391-402 (1978) [20 ref. En] [Dep. of Anim. Sci. & Plant Pathology, Univ. of Minnesota, St. Paul, Minnesota 55108, USA]

Broiler chicks were fed a standard diet until 1 wk of age and were then fed a diet containing 0, 0.5, 2.0 or 8.0 p.p.m. non-radioactive T-2 toxin (a metabolite of *Fusarium tricinctum*) until 6 wk of age. Some of the birds fed the diet containing 2.0 p.p.m. toxin were then intubated into the crop with tritium-labelled T-2 toxin in a single dose of 0.5 mg/kg body wt. and sacrificed 0.5, 4, 8, 12, 24 and 48 h after dosing. Other birds fed diets containing 0.5 and 8.00 p.p.m. toxin were similarly intubated with, resp., 0.126 and 1.895 mg tritium-labelled T-2 toxin/kg body wt. and sacrificed 24 h after dosing. Studies were made of the excretion and distribution of radioactivity in the chicks. Abdominal fat and heart contained the least amount of radioactivity. Radioactivity from the labelled toxin reached a max. 4 h after dosing in most tissues except muscle, skin and bile

where the max. was reached after 12 h. The edible portions of the carcasses contained 0.06 and 0.04 p.p.m. T-2 toxin (or its metabolites) 24 and 48 h, resp., after dosing with 0.5 mg labelled toxin/kg body wt. Results indicated that the toxin and/or its metabolites are excreted into the intestine via the bile and that the liver is the major organ for excretion. JA

66

Effect of different methods of processing and storage on the chemical composition of chicken sausage. Mahapatra, C. M.; Panda, B. *Indian Poultry Gazette* 63 (2) 72-78 (1979) [15 ref. En] [Div. of Poultry Res., Indian Vet. Res. Inst., Izatnagar, Uttar Pradesh, 243 122, India]

Chicken sausages were processed by (i) moist heating, (ii) dry heating, or (iii) smoking; and stored under refrigeration for 7 days, or under frozen storage for a month. The chemical composition of the sausages was significantly altered by treatment (i), but not by (ii) or (iii). The chemical composition did not change significantly under refrigerated storage; under frozen storage, however, some difference was observed in the total protein and total phospholipid contents. CFTRI

67

[Analysis of nicarbazin residues in chicken tissue.] Kamikura, M.; Eguchi, H. *Bulletin of the National Institute of Hygienic Sciences [Eisei Shikenjo Hokoku]* 96, 124-127 (1978) [2 ref. Ja, en] [Nat. Inst. of Hygienic Sci., Tokyo, Japan]

Nicarbazin (a coccidiostat; equimolar mixture of *p,p'*-dinitrocarbanilide and 2-hydroxy-4,6-dimethylpyrimidine) was extracted from homogenated chicken tissue with ethyl acetate and the extract cleaned up by alumina column chromatography, elution with chloroform and methyl alcohol (9:1). Analyses were performed by spectrophotometric and polarographic methods, with detection limits of 0.08 p.p.m. and 1 p.p.m., resp., in chicken tissue. [From En summ.] JRR

68

Influence of pH on *Clostridium botulinum* control by sodium nitrite and sorbic acid in chicken emulsions. Sofos, J. N.; Busta, F. F.; Allen, C. E. *Journal of Food Science* 45 (1) 7-12 (1980) [En] [Dep. of Food Sci. & Nutr., Univ. of Minnesota, 1334 Eckles Avenue, St. Paul, Minnesota 55108, USA]

Influence of H⁺ concn. on the effectiveness of NaNO₂ and/or sorbic acid to control *Clostridium botulinum* growth during elevated temp. abuse (27°C) of mechanically deboned chicken meat frankfurter-type emulsions was examined. Toxin production, spore germination (loss of heat resistance) and outgrowth, residual nitrite levels, and total microbial growth (aerobic colony forming units) were determined at specified times during the incubation period. The effect of sorbic acid (0.2%), alone or in combination with nitrite (40, 156 µg/g), in significantly (*P* < 0.05) inhibiting spore germination, growth, and toxin production was pH dependent. This effect was not observed at pH values > 6.20 and it increased with decreasing pH. Inclusion of nitrite in the formulation

increased the effective pH for sorbic acid inhibition of toxin production. The rapid rate of germination and outgrowth in both control and nitrite-containing treatments was not influenced by pH in the range examined (5.93-6.93). When sorbic acid was included in the formulation, there was a slower nitrite depletion during storage. This effect was also pH dependent and it was not observed at higher pH values (7.15). Total microbial growth was affected by decreasing pH, but not by the inclusion of nitrite and/or sorbic acid in the formulation. IFT

69

Effect of chilling and frozen storage on quality of chicken meat.

Pandey, N. K.; Mahaderan, T. D. *Indian Poultry Gazette* 63 (2) 64-71 (1979) [24 ref. En] [Div. of Poultry Res., Indian Vet. Res. Inst., Izatnagar, Uttar Pradesh, 243 122, India]

(i) Leg and (ii) breast muscles of chicken were chilled for 1, 2, 3 and 4 h and frozen stored at $-16 \pm 1^\circ\text{C}$ for 60 days; they were examined at intervals of 15 days for 2-thiobarbituric acid (TBA) values, total bacterial load, moisture and protein %, and storage loss and drip loss. TBA value in (i) and (ii) increased up to 30 days of storage after which it decreased at 45 days and then again increased at 60 days. TBA values were higher in (i) than in (ii) subjected to the same treatment. Bacterial loads on the skin surface of both (i) and (ii) were inversely proportional to the duration of storage and h of chilling. Duration of chilling did not significantly affect the moisture content of (i) and (ii); freezing for 60 days significantly decreased the moisture content of (i). Duration of frozen storage and chilling did not influence the total protein content of (i) and (ii), but significantly affected the freezing/storage loss, thawing loss and drip loss. 4 h chilled birds were consistently preferred for overall acceptance by a panel of judges over those chilled for shorter periods. CFTRI

70

Chicken blood plasma proteins: physicochemical, nutritional and functional properties.

Rio de Reyes, M. T. E. del; Constantinides, S. M.; Sgarbieri, V. C.; El-Dash, A. A. *Journal of Food Science* 45 (1) 17-20 (1980) [En] [Dep. de Planejamento Alimentar & Nutr. - UNICAMP, Caixa Postal, 1170, 13.100 Campinas, SP, Brazil]

Chicken blood plasma protein was prepared by collecting blood during the slaughter of animals using 0.5% sodium citrate solution as an anticoagulant. The blood cells were separated by centrifugation, and the plasma was recovered by freeze drying either before or after dialysis. Disc polyacrylamide gel electrophoresis gave a pattern with 9 protein bands, which was reduced to 7 bands when the sample and gels were treated with urea. Sodium dodecyl sulphate (SDS) gel electrophoresis furnished 9 protein bands with mol. wt. ranging from 24 000 to 115 000. Gel electrofocusing revealed 3 protein bands with isoelectric points of 5.7, 5.3 and 4.8, resp. Digestibility of the proteins was above 90%, and the protein efficiency ratio (PER) was 2.8 in comparison with 2.5 for casein. Addition of plasma to wheat flour for bread making at 2.5 and 5% levels raised the PER of bread from 0.87 to 1.67 and 2.02, resp. IFT

71

Nutritional factors affecting quantity and quality of carcass fat in chickens.

Bartov, I.

Federation Proceedings 38 (12) 2627-2630 (1979)
[32 ref. En][Dep. of Poultry Sci., Univ. of Georgia,
Athens, Georgia 30602, USA]

Aspects considered in this review include: effects of dietary energy level and energy/protein ratio on the fat content of chicken carcasses; amino acid supplementation and dietary protein quality in relation to fattening; effects of dietary fat on the level and fatty acid composition of carcass fat; effects of feed restriction or overfeeding; factors influencing the composition of carcass fat; and the relationship between composition and quality of carcass fat. AJDW

72

[Use of the San Pel coadjuvant in poultry slaughtering.]

Papparella, V.

Industrie Alimentari 18 (7/8) 541-542 (1979) [It]
[Istituto di Patologia Aviaria, Fac. di Med. Vet., Univ. di Napoli, Naples, Italy]

To ascertain the hygienic and sanitary role of the coadjuvant San Pel (containing (i) SiO_2 and (ii) alkyl lauryl sulphonates) used in processing chickens at 3 industrial plants in Campania, the skins of plucked carcasses of Hubbard broilers were analysed for residues of (i) and (ii). No (ii) was discovered in the washed carcasses, and amounts of (i) were too small (0.65 p.p.m.) to be harmful. Cultures prepared from water used to scald the carcasses and from carcass skins for counting total bacteria, coliforms and salmonellae (figures for total bacterial count and coliforms only are tabulated) initially and after 1, 2½, and 4 h, using 2 solutions of San Pel (dilutions of 0.075% and 0.15% vs. control 0%) showed a significant drop in bacterial development in presence of San Pel. KME

73

Control of pH in generating chlorine dioxide for bactericidal use in poultry processing water.

Lillard, H. S.

Journal of Food Science 45 (1) 154, 156 (1980) [En]
[USDA, Richard B. Russell Agric. Res. Cent., SEA-AR,
PO Box 5677, Athens, Georgia 30604, USA]

This study showed that there is no significant difference in total aerobic counts, faecal coliform levels, and salmonellae incidence of chiller water or broiler carcasses when pH of the chlorine dioxide generating system is controlled with either HCl (aq.) or Cl_2 gas. Also, there is no difference in mean number of days of shelf-life of carcasses processed in water treated by either method. IFT

74

Effect of fermentation and palm oil on the performance of broilers receiving cassava diets in the tropics.

Adeyanju, S. A.; Pido, P. P.; Adegbola, A. A.

Animal Production 29 (2) 239-244 (1979) [17 ref. En]

[Dep. of Anim. Sci., Univ. of Ife, Ife-Ife, Nigeria]

The effect of fermentation on cassava meal (CM) diets supplemented with 0, 2, 4 and 6% levels of palm oil on the performance, carcass characteristics and economic value of broiler chickens was studied. During the growing phase, fermentation had no influence on growth rate, but resulted in reduced mortality and improved efficiency of feed utilization in the chickens. However, there were greater intakes of fermented CM diets, higher efficiency of feed utilization, better growth rate and reduced mortality during the finishing phase. Abdominal fat was lower during both phases in chickens given fermented CM (FCM) diets than those given CM diets. There were economic benefits in reduced feed cost, increased gross revenue and higher revenue less feed cost values in FCM than in CM diets. There were nonsignificant reductions in feed intake, mortality rate, daily rate of gain, final body wt. and carcass quality, but significant economic benefits during both growing and finishing phases as the level of supplementary palm oil increased in the diets. The results suggest that while about 2% palm oil might be required in FCM diets, 2 to 4% would be needed in CM diets by broiler chickens for comparable performance. AS

75

Recovery of *Salmonella* from refrigerated preenrichment and enrichment broth cultures.

D'Aoust, J. Y.

Abstracts of the Annual Meeting of the American Society for Microbiology 79, 211 (1979) [En] [Health & Welfare Canada, Ottawa, Canada]

Refrigeration (4°C) of non-selective and selective enrichment broth cultures for 72 h did not markedly affect recoverability of *Salmonella* from 112 naturally contaminated low and high moisture foods and feed ingredients. Standard cultural procedures included preenrichment (35°C) in a non-selective liquid medium, enrichment in tetrathionate brilliant green (43°C) and selenite cystine (35°C), and plating on brilliant green sulpha and bismuth sulphite agars. Recoveries from refrigerated preenrichment and enrichment cultures were 95 and 98%, resp. All foods except chicken gave identical results under standard and refrigerated analytical conditions. Tetrathionate brilliant green was generally more productive than selenite cystine, particularly with raw meat samples. Refrigeration of broth cultures provides greater method flexibility by increasing the number of days on which analyses can be initiated without engendering work outside a normal work week to complete analyses. AS

76

[Effects of graded levels of dietary cellulose on carcass lipid deposition in force-fed chicks.]

Akiba, Y.; Satoh, K.; Matsumoto, T.

Japanese Journal of Zootechnical Science [Nihon Chikusan Gakkai-ho] 50 (8) 592-597 (1979) [18 ref. En, ja] [Fac. of Agric., Tohoku Univ., Sendai 980, Japan]

Groups of Single-Comb White Leghorn chicks (14 days of age at the start of the experiment) were used in a 14-day feeding trial on effects of diets containing 0, 1, 2 or 8% cellulose (as powdered filter paper) on carcass lipid deposition. The birds were force-fed

3 times/day, metabolizable energy intakes being identical on the various diets. The chickens were slaughtered at the end of the feeding trial. Tables and graphs are given showing growth rate, liver wt. and lipid content, nutrient retention in the carcass, etc. The results show that cellulose supplements significantly reduced liver wt. and the % lipid in the liver; the decrease was greater for the 2% or 8% cellulose diets than for the 1% cellulose diet. Cellulose supplementation did not significantly influence retained protein, lipid and energy content in the carcass + liver or carcass without liver. Abdominal fat was significantly correlated with carcass lipid content ($r = 0.63$). AJDW

77

A second look at conifer MUKA in broiler rations.

Gerry, R. W.; Young, H. E.; Rowe, R. J. *Research in the Life Sciences* 26 (4) 7pp. (1979) [4 ref. En] [Life Sci. & Agric. Exp. Sta., Univ. of Maine, Orono, Maine, USA]

Results of 4 experiments conducted with dried and ground spruce and fir needles (MUKA), fed at levels of 0–5% in the ration, indicated that MUKA added little if anything of value to modern rations fed to broiler chickens in the USA. Pigment scores for skin (feather tracts) were variable with no trends noted; the only statistically significant difference in skin pigment score was between the 1.25% spruce MUKA and the 2.5% spruce MUKA which produced respectively the lowest and highest scores in the test. AL

78

Sodium nitrite and sorbic acid effects on *Clostridium botulinum* spore germination.

Sofos, J. N.; Busta, F. F.; Allen, C. E.

Abstracts of the Annual Meeting of the American Society for Microbiology 79, 214 (1979) [En] [Univ. of Minnesota, St. Paul, Minnesota, USA]

Spore germination (loss of heat resistance) and cell growth were observed during 27°C incubation of mechanically deboned chicken meat (MDCM) frankfurter emulsions inoculated with 10 strains of *C. botulinum* spores. The treatments were formulated to contain sodium nitrite and/or sorbic acid. *C. botulinum* spore counts were determined by a 5-tube MPN procedure in modified peptone colloid medium after 7 days at 37°C. Standard plate count agar (Difco) and 48 h aerobic incubation at 37°C were used to measure aerobic colony forming units (CFU). Spores germinated rapidly and within 3 days in the control and the samples containing nitrite (20, 40 and 156 µg/g). Sorbic acid (0.2%) alone or in combination with nitrite significantly ($P < 0.05$) inhibited spore germination. Increases in aerobic CFU were not affected by nitrite, whereas sorbic acid appeared to retard these increases. Nitrite did not retard spore germination; therefore, the effect of nitrite on botulin toxin production must be on germinated spores or cells. Sorbic acid apparently delays toxin production, at least in part, by depressing spore germination. When coupled with nitrite action, a combination of sorbic acid and nitrite dramatically delayed toxin production. AS

79

Effects of dietary fat on carcass lipid deposition in growing chicks.

Takahashi, K.; Akiba, Y.; Matsumoto, T.

Japanese Journal of Zootechnical Science [Nihon Chikusan Gakkai-ho] 50 (10) 727–734 (1979) [28 ref. En, ja] [Fac. of Agric., Tohoku Univ., Sendai-shi 980, Japan]

A total of 64 male White Leghorn chicks (14 days of age at the start of the trial) was used in a study on effects of diets containing 12% lard, hydrogenated lard or coconut oil (substituted isocalorically for glucose) on carcass lipids. The birds were slaughtered after 14 days on the experimental diets, and carcass lipids were analysed. Data are given for protein, fat and energy retention, incorporation of lauric and margaric acids into carcass lipid, the wt. and the protein, total lipid, triglyceride, phospholipid and free fatty acid contents of the liver, and the correlation between carcass lipid deposition and incorporation of margaric acid into carcass lipid. Incorporation of margaric acid into carcass lipids was highest for birds receiving the lard diet, followed by the coconut oil diet; incorporation of lauric acid into carcass lipids was depressed by the hydrogenated lard diet. Dietary treatments had little effect on contents of protein, total lipid and lipid fractions in the liver. AJDW

80

[Viscoelastic properties of chicken breast meat, and differences in these properties between breeds and between sexes.]

Watanabe, Y.; Gotoh, N.

Japanese Journal of Zootechnical Science [Nihon Chikusan Gakkai-ho] 50 (10) 694–699 (1979) [14 ref. Ja, en] [Aizu Junior Coll., Fukushima Prefecture, Aizuwakamatsu-shi 965, Japan]

57 chickens were used in studies on effects of breed and sex on the viscoelastic properties of breast meat (*pectoralis profundus* muscle). Studies were conducted on samples from purebred Hinaidori (H), White Cornish (C), White Rock (R) and White Leghorn (L) birds and H × C, H × R and Shamo × L crossbreds. Muscle samples were collected, placed in polyethylene bags, immediately frozen in dry ice, and held at –17°C for at least 24 h. 50 × 20 × 2–4 mm strips were then cut with the long axis parallel to the muscle fibres, dumbbell-shaped samples were then stamped out, and stress relaxation measurements were conducted using a Chainomatic Balance Food Rheometer, samples being stretched 13.5 mm at a rate of 2.8 mm/s. Data are given for F_{max} , τ and S/fo values. The results show that: F_{max} was lower for Shamo × L crossbreds than for any other group; S/fo was greater for Shamo × L than for purebred L; a sex difference was observed for both F_{max} and S/fo value in H; and F_{max} was higher for males than for females in H, C, H × C, and H × R. [From En summ.] AJDW

81

Recovering low levels of various *Salmonella* serotypes from deep-frozen broiler carcasses by direct enrichment.

Cox, N. A.; Mercuri, A. J.

Journal of Food Protection 42 (8) 660-661 (1979)
[15 ref. En][Microbiol. Res. Unit, USDA, Richard B.
Russell Res. Cent., Athens, Georgia 30604, USA]

240 broiler carcass halves were each inoculated with either 14 or 180 cells of *Salmonella typhimurium*. Each carcass half was then placed in a plastic bag, blast-frozen (-40°C) for 6 h, and stored at -23°C . After 1, 7 and 30 days of frozen storage, 80 of these samples were removed and allowed to thaw; then each carcass-half was shaken in its bag with 150 ml of added sterile water. Lactose broth was used to preenrich 40 of these rinse-fluid samples and selenite cystine broth was used for direct enrichment of the remaining 40 samples. *S. typhimurium* was successfully recovered from all 240 samples. Other serotypes successfully recovered by direct enrichment on similarly frozen carcass-halves stored for 30 days were *S. californica*, *S. derby*, *S. heidelberg*, *S. montevideo*, *S. newport* and *S. senftenberg*. These data suggest that a preenrichment medium such as lactose broth may not be necessary for detection of salmonella on frozen broiler carcasses
AS

82

[Evaluation of inexpertly cut poultry portions.]

Beurteilung unsachgemäß hergerichteter Geflügelteile.
Schulze, K.; Zimmermann, T.
Fleischwirtschaft 59 (10) 1476-1477; 1504 (1979) [2 ref.
De, en][Veterinäruntersuchungsamt des Landes
Schleswig-Holstein, Max-Eyter-Strasse 5,
2350 Neumünster, Federal Republic of Germany]

Investigations on whole chicken thighs are described. Some imported brands showed considerable deviations from the correct cut, especially regarding separation at the hip joint: this was often incomplete or omitted altogether. Grading and food regulation instructions are applied when evaluating deviations from the norm. AS

83

[Effects of energy level and pelleting of the diet on growth and fattening performance of guinea fowl as compared with chickens.]

Blum, J.-C.; Leclercq, B.
Annales de Zootechnie 28 (3) 261-269 (1979) [8 ref. Fr,
en][Sta. de Recherches Avicoles, INRA, Cent. de Tours-
Nouzilly, 37380 Monnaie, France]

Groups of chickens and guinea fowl were fattened from 7 to 84 or 98 days of age on diets of 2 energy levels (2900 vs. 3240 kcal metabolizable energy/kg) and 2 physical forms (mash vs. pellets). Tables of data are given for various performance characteristics of guinea fowl and chickens, and for carcass quality characteristics (1% abdominal fat, total lipid wt., fat free mass) of guinea fowl. Results for birds slaughtered at both ages show the low-energy diet to give significantly lower abdominal fat % and total lipid wt. in the carcass than the high energy diet, and males to be less fat than females. No sex or diet-related effects on fat-free carcass mass were observed. Abdominal fat %, total lipid wt., and fat-free carcass mass were all higher for the birds slaughtered at 98 days than for those slaughtered at 84 days of age. A)DW

84

Extension of shelf-life of fresh, whole broilers, using a potassium sorbate dip.

Robach, M. C.
Journal of Food Protection 42 (11) 855-857 (1979)
[15 ref. En][Monsanto Co., 800 N. Lindbergh Blvd.,
St. Louis, Missouri 63166 USA]

The shelf life of fresh, whole broilers was extended by dipping freshly chilled carcasses into a 5% (w/v) solution of potassium sorbate for 30 s. 100 broilers were removed from a processing line immediately following the final chill tank. 50 carcasses were dipped in water for 30 s, and 50 were dipped in the sorbate solution for 30 s. The birds were allowed to drain and then individually bagged and stored at 3°C until spoilage odours were noted. The control birds were stored for 10 days when spoilage was evident, and the sorbate-treated birds were stored for 19 days, at which time spoilage was evident. AS

85

[Studies on natural flavouring substances. IV. Properties of the cooking flavours of chicken fractions.]

Ishida, K.; Yamamoto, A.
Journal of Japanese Society of Food Science and Technology [Nippon Shokuhin Kogyo Gakkaishi] 25 (7) 367-373 (1978) [15 ref. Ja, en][Tokyo Res. Lab.,
Kyowa Hakko Kogyo Co. Ltd., Machida-shi, Tokyo,
Japan]

The properties of cooking flavours of chicken fractions (lean meat, skin and adipose tissue) were investigated. The flavours were evaluated by sensory testing, gas chromatography, and detn. of H_2S and volatile reducing substances (VRS). The cooking flavour of chicken lean meat was best, and was intensified by blending with skin or adipose tissue. The strongest chicken flavour and a large amount of H_2S and VRS were produced from the water soluble protein (sarcoplasmic protein) fraction of lean meat. Chicken-like aroma and a small amount of H_2S and VRS were also produced by cooking of the salt-soluble protein (myofibrillar protein) fraction and the stroma fraction. Therefore, it may be assumed that these protein fractions also contribute to the production of cooking flavour of chicken. The strength of chicken aroma and the amount of VRS produced during cooking were decreased by defatting the lean meat and the skin. It was confirmed that taste substances were retained in the aqueous fraction of chicken broth, and aroma substances in the oil fraction. These results suggest that the combined use of these 2 fractions is desirable in seasoning manufacture. AS

86

[Determination of chlorinated pesticide residues by gas chromatography.]

Dubsky, H.; Hana, K.; Komarkova, M.; Rittich, B.
Veterinarni Medicina 24 (8) 493-498 (1979) [13 ref. Cs,
en, ru, de][Lekarska Fak., Univ. J. E. Purkyne,
662 99 Brno, Czechoslovakia]

Kovats [*Helvetica Chimica Acta* (1958) 41, 1915]
retention indices are tabulated for 16 chlorinated

pesticides in separations using 4 GLC column packings and a Pye gas chromatograph. A packing consisting of 3% OV-17, 3% XE-60, and 7.5% QF-1 (ratio 2:1:2) on diatomite CQ, and a column temp. of 200°C were found the most suitable. The following residue contents were detected, resp., in 10 samples of spring water (from March and April 1977 in the Brno district), and 6 samples of broiler abdominal fat, (median values with ranges): hexachlorobenzene, 0 (0-0.64) and 0.41 (0.254-0.515) mg/kg; γ -BHC, 0.08 (0-0.015) and 0.183 (0.125-0.647) mg/kg; and total DDT, 0.007 (0-0.012) mg/kg and not stated. SKK

87

[The relation between duration of fattening, retail grade and meat quality of broilers.] Zusammenhänge zwischen Mastdauer, Handelsklasse und Fleischbeschaffenheit bei Broilern.

Ristic, M.

Fleischerei 30 (9) 696-698 (1979) [12 ref. De]

[Bundesanstalt für Fleischforschung, D-8650 Kulmbach, Federal Republic of Germany]

A total of 80 broilers was used in a study on effects of fattening period (5-8 wk) on carcass quality, meat quality, and breast muscle pH₁ (15 min post mortem). Tables of results are given, including data for cooking loss, juiciness, tenderness, flavour, overall sensory quality, cutting loss, and meat, fat, bone, skin and tendon contents of the breast and thigh meat. The results show carcass yield to increase with increasing age at slaughter. Meat and tendon contents of the carcass tended to increase and bone contents to decrease with increasing fattening period; variations in skin and fat contents were small and variable. Cooking loss decreased and sensory scores tended to improve with increasing fattening time. 69.3% of carcasses were of commercial quality grade A, 26.1% were of grade B and 4.6% of grade C. Breast muscle pH₁ varied over the range 5.40-6.90 (mean 6.06). 5.6% had pH₁ < 5.7 (indicating pale soft exudative meat), 19.7% had pH₁ > 6.3 (indicating dark firm dry meat) and 74.7% had pH₁ of 5.7-6.3 (indicating normal meat quality). AJDW

88

Oily bird problems causes losses in processing yields. Edwards, H. M., Jr.

Feedstuffs 52 (7) 24-25 (1980) [En]

Problems with the 'oily bird' syndrome of broilers, in which carcasses have a high content of liquid fat beneath the skin, which is released during evisceration, are discussed. Considerable yield losses may occur, the carcass is less attractive, and the released fat may flow over the birds, equipment, workers, etc. It is thought that the syndrome is due to birds with a large amount of subcutaneous fat with a high unsaturated fatty acid content (and hence low m.p.); the fat is melted during scalding, and the fatty tissue is disrupted during plucking. Factors influencing incidence of the syndrome include diet, sex, age, season, scalding conditions, and plucking conditions. Tables of data are given showing effects of dietary protein on carcass fatness, and effects of dietary fats on performance, carcass composition and fatty acid composition of broilers. AJDW

Evaluation of tuber meals as energy sources. I. Sweet potato- and cassava-based rations for broilers.

Gerpacio, A. L.; Pascual, F. S.; Querubin, L. J.; Vergel de Dios, A. F.; Mercado, C. I

Philippine Agriculturist 61 (9/10) 395-410 (1978)

[15 ref. En] [Coll. of Agric., Univ. of the Philippines at Los Banos, Laguna, Philippines]

The performance of 2-wk old birds fed to 6 wk with diets containing 0, 25, 37.5 and 50% of either sweet potato or cassava tuber meal (0, 50, 75 and 100% replacement of corn in the diets) was studied. Tabulated results showed no differences in dressing % (with and without giblets) and % bone and lean; the intensity of shank colour (Roche colour fan scale) decreased with reduction in the % of corn (from 8.00 for control, to 2.00-3.00 for 100% substitution). RM

89

[Methods for determining the water content in broilers.] Methoden zur Bestimmung des Wassergehaltes in Schlachthähnchen.

Bolder, N. M.; Hofmans, G. T. P.; Gerrits, A. R.; Veerkamp, C. H.

Fleischwirtschaft 59 (11) 1712-1713, 1716-1720 (1979)

[12 ref. De, en] [Inst. für Geflügelforschung, Het Spelderholt, 7631 DA Beekbergen, Netherlands]

256 broilers were slaughtered under completely dry conditions, ground and homogenized (with or without bones), and analysed for protein, fat and DM. Results were used to calculate the ratios of protein or fat-free DM contents to the physiological water content of the whole carcass or its component parts (edible and inedible). No differences were found between the physiological water contents calculated from fat-free DM or from protein contents. Water uptake under practical conditions was measured in 5 poultry slaughtering plants, using regression equations to calculate physiological water content. Water uptake was also determined by the drip method and the implant method [Appendix 1 of EEC regulation 2967/76]. The water uptake calculated from protein or from fat-free DM was similar to the values measured by the implant method. [From En summ.] RM

90

Impact of improved management practices on poultry broilers.

Keshri, R. C.; Singh, B. P.; Devroy, A. K.

Poultry Guide 16 (11) 99-100 (1979) [En] [Poultry Div., Indian Vet. Res. Inst., Izatnagar, India]

91

[Digestibility of proteins of different kinds of chicken meat.] Zur Verdaulichkeit der Proteine verschiedener Hühnerfleischarten.

Schönhauser, E.; Schönhauser, R.; Blumenthal, A.

Mitteilungen aus dem Gebiete der Lebensmitteluntersuchung und Hygiene 70 (4) 509-516 (1979) [6 ref. De, en, fr] [Inst. für Ernährungsforschung der Stiftung "Im Grüene", Rüslikon, Switzerland]

In vitro protein digestibility of meat parts from manually deboned chicken carcasses, and of meat from mechanically deboned (MDB) carcasses was studied.

Tabulated results show protein digestibility after incubation of raw and cooked samples in the presence of only the enzymes existing in the meat samples (autolysis) or with addition of pepsin + pancreatin. The method used is described in detail. Without enzyme addition, digestibilities showed wide variations, with means for the various meat parts in the range 15–20%, except for raw MDB carcass meat, which showed digestibility due to autolysis of >40%. With addition of enzymes, mean digestibilities of all raw samples were 79–92%. Digestibilities of cooked samples due to autolysis showed much smaller variation, with means in the range 6–8.5%. After addition of enzymes digestibilities were 78–89%. Cooked MDB samples showed no significant differences to cooked manually deboned samples. DIH

92

An outbreak of streptococcal infection in a chicken factory.

Barnham, M.; Kerby, J.; Skillin, J.
Journal of Hygiene 84 (1) 71–75 (1980) [6 ref. En] [Dep. of Microbiol., Harrogate General Hospital, Harrogate HG2 7ND, UK]

This outbreak of streptococcal skin infection, the first reported in a poultry factory in England, occurred in 1978 in a plant which slaughters, eviscerates, packs and freezes 33 000 chickens/day on a conveyor line. Of the total workforce of 347, 82 people were infected, the highest incidence occurring in the packing section where 66 of the 149 workers were affected. Those infected mostly suffered impetiginous or eczematous lesions, paronychia and infected lacerations of the hands. Of the 82 infected workers, 19 suffered a second episode of infection and 2 suffered a third attack. All those infected either handled chickens or were in contact with the processing equipment. There was evidence of spread of the infection to the families of 2 workers. Bacteriological studies within the factory identified the causative organism as *Streptococcus pyogenes* T-type 3/13/B3264, provisional M-type 'R78/55'. The routes of introduction of the infection into and spread within the factory remain mostly unknown. Following identification of infected persons and carriers and the institution of appropriate treatment and control measures, the outbreak rapidly declined. JA

93

[Cortisol distribution in chicken organs and tissues.]
Madzharov, I.; Riko[Ricaux], A.

Zhivotnov'dni Nauki 15 (7) 99–103 (1978) [11 ref. Bg, ru, en] [Inst. po Zhivotnov'dstvo, Kostinbrod, Bulgaria]

³H-labelled cortisol was injected into the breast muscle of 5-day-old Plymouth Rock chicks, and presence of label was studied in various organs and tissues 2, 6, 12 and 24 h after injection; the skeletal muscles, liver and gizzard were found to be the main targets of the injected hormone. SKK

94

[Slaughter results and meat quality characteristics of broilers reared on litter or in cages.]
Beremski, Ch.

Zhivotnov'dni Nauki 15 (8) 38–43 (1978) [14 ref. Bg,

ru, en] [Nauchno-Proizvodstveno Obedinenie po Ptitsev'dstvo, Kostinbrod, Bulgaria]

2 matched groups of 120 chicks were reared to broiler wt. (approx. 1700 g at 8 wk of age) resp. (i) on floors on litter (at 12 birds/m²) or (ii) in cages (at 30 birds/m²). Tabulated slaughter results (for 10 male + 10 female birds) include for (i) and (ii) resp.: breasts + legs as % of carcass, 60.9 and 60.6; moisture content, breast 73.2 and 73.4, and leg 73.0 and 72.6%; crude protein content, breast 22.4 and 22.7, and leg 20.8 and 21.3%; and crude fat content, breast 2.5 and 2.4, and leg 4.6 and 5.5%. Results of organoleptic assessment of aroma, taste, consistency and juiciness of white and dark (i) and (ii) meat are tabulated; no substantial differences between (i) and (ii) were found. SKK

95

Selection for food conversion in broilers: body composition of birds selected for increased body-weight gain, food consumption and food conversion ratio.

Pym, R. A. E.; Solvyns, A. J.
British Poultry Science 20 (1) 87–97 (1979) [33 ref. En] [Poultry Res. Sta., Seven Hills, NSW 2147, Australia]

Body composition was determined in 9 wk old chickens sampled from 4 breeding lines selected for increased body wt. gain (line W), for increased food consumption (line F), for decreased food conversion ratio (line E) or at random (line C) after 3, 4 and 5 generations of selection. After 5 generations, the proportions of carcass water (678 g/kg) and protein (187 g/kg) were highest in line E and lowest (636 g and 180 g/kg, resp.) in line F. Fat proportions were highest in line F (134 g/kg) and lowest in line E (83 g/kg). Lines W and C were similar to one another, and intermediate between E and F for all carcass constituents. Females contained more fat (115 g vs. 98 g/kg), and less protein (177 vs. 190 g/kg) and water (652 g vs. 665 g/kg) than did males. Line differences in carcass composition were not appreciably altered if birds were killed at equal wt. rather than equal age. AS

96

[Pharmacokinetic studies of 'Farmakhim' tylosin phosphate.]

Donev, B.; Kamenska, M.; Stoyanov, K.
Veterinarnomeditsinski Nauki 16 (1) 82–93 (1979) [9 ref. Bg, ru, en] [Tsentralna Lab. za Kontrol na Vet. Preparati, Sofia, Bulgaria]

Contents of tylosin were determined in various internal organs and tissues of groups of 2–4 broilers killed at 13 intervals (from 2 to 120 h) after single administration by mouth of tylosin-220 (a granular preparation of tylosin phosphate containing 220 IU/mg made by DSO 'Farmakhim' in Bulgaria) at a dose of 500 mg/kg body wt. Tabulated results include the following contents (µg/g) 2, 4 and 24 h after administration: liver, 10.3, 5.0 and 1.0; heart, 2.2, 1.7 and 0.1; and muscle, 3.6, 11.2 and trace; tylosin was absent from all sites examined 96 h after administration. Pigs (size not stated) received for 33 days (i) 0.5 or (ii) 2.5 kg tylosin 220/t ration or similarly (iii) 2.5 kg tylosin AF99 (Elanco, USA) granular preparation of same activity as tylosin 220. Contents of tylosin were determined in

various tissues and organs of single pigs on the 15th and 33rd days of administration and on the 2nd, 5th and 7th days after administration had ceased. Tabulated values ($\mu\text{g/g}$) include on the 33rd and 2nd days resp. for (i)-(iii): liver, 0, trace and trace, and trace for all 3; muscle, 0, 0.1 and trace, and 0, 0.33 and trace; and backfat, 0, 0.1 and 0.1, and trace, 0.2 and trace. No tylosin was detected in any of the sites 5 or 7 days after administration had ceased. SKK

97

Effect of formic acid treatment of chicken feed on the taste of the resultant broiler meat.

Basker, D.; Klinger, I.

Refuah Veterinarith 36 (2) 40-42 (1979) [9 ref. En] [Agric. Res. Organization, Volcani Cent., Bet Dagan, Israel]

Addition of formic acid to animal feed has been suggested as a method for elimination of pathogenic microorganisms. Studies were conducted to determine whether feeding a diet containing 1.2% formic acid influenced the organoleptic properties of the meat of Leghorn meat race chickens, fed the experimental diet up to slaughter at 9 wk of age. Control chickens received a diet without formic acid. Carcasses of the experimental and control groups of chickens were stored at -18°C for approx. 2 months, thawed, and dark and light meat were cooked separately in salted water. The organoleptic properties of the samples were then evaluated by a taste panel. The results show that taste panellists could not accurately differentiate between experimental and control samples. No significant difference was found in general quality, texture, juiciness or meatiness between the experimental and control meat samples; however, panellists expressed a preference for meat from the birds fed the formic acid-containing diet. AJDW

98

Standards for water in EEC poultry meat.

Dutschke, G.

Fleischwirtschaft 59 (12) 1810, 1812, 1815-1819; 1864-1867 (1979) [29 ref. En, De] [Turmfalkenweg 4, 5300 Bonn 1, Federal Republic of Germany]

EEC regulation No. 2967/76 of 23 Nov. 1976 laying down common standards for the water content of frozen and deep-frozen capons, hens and broilers, and the amended revision No. 641/79 of 29 March 1979 is reviewed. It deals with absorption of water during slaughtering and chilling, standards, test methods and penalties. Serious doubts on its effectiveness and applicability have arisen due to the different control methods, differences in treatment of marketed meat (especially cut portions), lack of a clear definition of the technically unavoidable water content and the specified sizes of samples. RM

99

[Poultry for meat. Hens: general breeding requirements.]

Bulgaria, D^rzhaven Komitet za Standartizatsiya
Bulgarian Standard BDS 14774-79, 5pp. (1979) [Bg]

100

[Residues of Amprolium in hen tissues and in eggs.] Rückstandsverhalten von Amprolium im Huhn und im Ei.

Petz, M.; Vogt, H.; Thier, H.-P.

Archiv für Geflügelkunde 43 (5) 200-204 (1979)

[11 ref. De, en, fr, ru] [Inst. für Lebensmittelchem., Univ., 4400 Münster, Federal Republic of Germany]

45 young LSL hens (26.5 wk of age at the start of the trial) were used in a study on accumulation and persistence of residues of the coccidiostat Amprolium in tissues and in egg yolk. The birds were fed diets with (i) 0.0125 or (ii) 0.025% Amprolium for ≤ 32 days. Tables and graphs of results are given showing residue concn. after feeding Amprolium for various periods, and changes in residue concn. after withdrawal of dietary Amprolium. Residue concn. in egg yolk increased rapidly to approx. 1.3 mg/kg for (i) or 2.0 mg/kg for (ii), then remained approx. constant; residue concn. in the egg yolk decreased to <0.1 mg/kg within 7-8 days after withdrawal of dietary Amprolium. Max. Amprolium residue concn. recorded in hen tissues were, for (i) and (ii), resp. (mg/kg): liver, 0.80 and 1.10; breast muscle, 0.13 and 0.29; leg muscle, 0.12 and 0.27; heart, not detectable and 0.41; skin, 0.12 and 0.30; and fatty tissue, 0.18 and 0.62. Residue concn. in hen tissues decreased to <0.1 mg/kg within 3 days after withdrawal of dietary Amprolium. Storage and cooking had no effect on Amprolium concn. in edible tissues. AJDW

101

[The carry-over of Pb, Cd and Hg in chickens.] Zum carry-over Verhalten von Blei, Cadmium und Quecksilber bei Hühnern. [Review]

Nezel, K.

Mühle + Mischfuttertechnik 117 (3) 30-32 (1980)

[16 ref. De]

The distribution of Pb, Cd and Hg was determined in the tissues of broilers and hens after prolonged feeding with contaminated feeds, and also in eggs laid by the hens. The data are used to show the carry-over of these toxic metals into edible tissues and eggs. RM

102

Distribution, production, analysis and effects of aflatoxin in animal tissues and effects of scirpene toxins on chicken embryos.

Obioha, I. W.

Dissertation Abstracts International, B 40 (5) 2103-2104; Order no. 79-24259, 152pp. (1979) [En] [Iowa State Univ., Ames, Iowa 50010, USA]

Studies of the effects on 3-wk-old chickens of a single oral dose of 1 mg ^{14}C -labelled aflatoxin B₁ and on 6-wk-old chickens of a single oral dose of 10 mg unlabelled aflatoxins indicated that most of the aflatoxins were excreted in the faeces within 48 h and that of the aflatoxins retained most occurred in the liver. A further study involved inoculation of fresh pork sausage (containing 2.5% NaCl and either 156 or 200 p.p.m. NaNO₂) with *Aspergillus parasiticus* and incubation at 5, 26 or 37°C. No mould growth and no aflatoxin production were observed at 5°C. Mould growth and aflatoxin B₁ production were observed at 26° or 37°C,

more aflatoxin being produced at the lower temp. A final study involved spreading *Asp. parasiticus* on Sabouraud glucose agar (containing 50, 156, 200 or 500 p.p.m. nitrite as NaNO_2) and incubating at 24°C . Examination after 4 days indicated more mould growth at the lower nitrite levels; storage for >4 days resulted in more mycelia and spore formation at the higher nitrite levels. JA

103

Feed and intestinal microflora as factors in the flavor and quality of broiler meat.

Sheldon, B. W.

Dissertation Abstracts International, B 40 (5) 2104: Order no. 79-25383, 230pp. (1979) [En] [Virginia Polytechnic Inst. & State Univ., Blacksburg, Virginia 24061, USA]

Feed ingredients were evaluated to determine whether they alter chicken growth rate, broiler meat flavour, gut bacterial counts of the production of fatty acid fermentation products in the gut. The ingredients evaluated were a fermented whey product (Sheftene WP-100), lactose, a steam-sterilized basal ration, a steam-sterilized basal ration containing added vitamins, and various antibiotics (including penicillin G). Sensory evaluation by taste panels, gas chromatographic analyses and culturing of the intestinal microflora of the chickens were used to assess the effects of the various feed ingredients. On the basis of the results obtained, it is concluded that such ingredients can alter the intestinal fermentation products and microflora, and that such alterations can have a significant influence on broiler meat flavour. JA

104

The rapid detection of polyphosphate in broiler chicken breast muscle.

Grey, T. C.; Robinson, D.; Jones, J. M.

Journal of Food Technology 14 (6) 587-593 (1979) [4 ref. En] [Food Res. Inst., Colney Lane, Norwich NR4 7UA, UK]

A rapid method for routine detection of injection of NaCl, polyphosphate or mixtures of these into broiler breast muscle is described. Breast muscles are dissected out, cut up and homogenized in 15% trichloroacetic acid (TCA). After filtration and dilution of the extract, Na and P detn. was either applied immediately or after sample digestion in H_2SO_4 . P was determined by molybdovanadate reagent, and Na by AAS. Uninjected broiler muscles contained (after TCA extraction and digestion) 0.34-0.38% P_2O_5 (muscle wet wt.) and 0.030-0.036% Na, i.e. a $\text{P}_2\text{O}_5/\text{Na}$ ratio of 10.3-11.9. Corresponding figures without acid digestion are 0.28-0.33% P_2O_5 , 0.032-0.40% Na, $\text{P}_2\text{O}_5/\text{Na}$ ratio 8.3-8.8. Injection of NaCl alone elevated Na levels and markedly reduced the ratio; injection of polyphosphate + NaCl markedly reduced $\text{P}_2\text{O}_5/\text{Na}$ ratio and increased P and Na levels; injection of polyphosphate alone reduced $\text{P}_2\text{O}_5/\text{Na}$ ratio, but not by as much as when NaCl was injected. Digestion was not necessary to confirm injections. Complete analysis takes 1.5 h. DIH

105

[Feeding broiler chickens with high levels of acidulated safflower (*Carthamus tintorius*) and fish soap-stocks. I. Effect on growth and carcass chemical composition.]

Camiruaga, M.; Vega, J. A. de la; Burdiles, S. *Ciencia e Investigación Agraria* 6 (3) 191-200 (1979) [19 ref. Es, en] [Dep de Zootecnia, Univ. Catolica de Chile, Santiago, Chile]

Incorporation of 15% safflower acidulated soap-stock (AAS) or 15% fish ASS in the rations of broiler chickens had no significant effect on carcass crude protein, moisture or fat contents compared with the controls (without ASS). There was a high coeff. of correlation ($r = 0.99$) between ASS fatty acid content and broiler body fat. The unsaturated:saturated fatty acids ratio was significantly higher in the body fat of broilers receiving safflower ASS than with the other diets, due primarily to the higher linoleic acid content. [From En summ.] HBr

106

Comparative nutritive value of beef, mutton and chicken meats and their extracts.

Raziq, F.; Ahmad, I.; Shah, S. B. A.

Pakistan Journal of Scientific Research 31 (1/2) 22-25 (1979) [11 ref. En] [Fac. of Agric., Univ. of Peshawar, Peshawar, Pakistan]

The chemical and amino acid compositions of beef, mutton and chicken meat and meat extracts (yaklini commonly used in Pakistan) were compared. Tabulated data showed significant differences in % fat (3.39, 5.49 and 7.30% resp. in meat, 1.09, 2.63 and 3.70% resp. in extracts) and % ash (1.30, 1.16 and 1.15% resp. in meat, 0.28, 0.23 and 0.23% in extracts) and also in amino acid composition. The extraction of amino acids during preparation of the extracts was variable. RM

107

[Use of dried root crops in feeding of broilers.]

Piech, A.; Jamroz, D.; Fritz, Z.

Roczniki Naukowe Zootechniki, Monografie i Rozprawy No. 13, 49-58 (1979) [16 ref. Pl, en, ru] [Inst. Zywienia Zwierzat i Gospodarki Paszowej, 50-375 Wroclaw, Poland]

900 Cornish \times White Rock broilers were used in an 8-wk feeding trial conducted to evaluate effects of partial substitution of dried sugar beet (DSB) or potato flakes (PF) for cereals on performance and carcass quality. 5 treatments were tested: (i) control diet, and diets with (ii) 10% DSB + 10% PF; (iii) 15% DSB + 15% PF; (iv) 25% DSB; and (v) 25% PF. Tables of results are given, including data for dressing %, % giblets, % breast muscle with skin, and the DM, crude protein and crude fat contents and water binding capacity of the breast muscle. Diets (i) and (iii) gave significantly higher % breast muscle with skin than diets (ii) and (iv). Diet (iv) gave significantly higher DM concn. in the breast muscle than diets (i) and (ii). AJDW

108

[Processed and low erucic acid rapeseed as components of feed mixtures.]

Piech, A.; Jamroz, D.; Fritz, Z.

Roczniki Naukowe Zootechniki, Monografie i Rozprawy No. 13, 37-48 (1979) [22 ref. Pl, en, ru] [Inst. Zywienia Zwierzat i Gospodarki Paszowej, 50-375 Wroclaw, Poland]

826 Cornish × White Rock broilers were used in an 8-wk feeding trial on effects of substitution of rapeseed for soybean meal on performance and carcass quality. 5 treatments were tested: (i) control diet, and diets with (ii) 5% raw rapeseed, (iii) 5% acid-treated rapeseed, (iv) 5% low-erucic acid rapeseed or (v) 10% low-erucic acid rapeseed. Tables of results are given, including data for dressing %, the % giblets, % breast muscle and % liver in the carcass, and the DM and crude protein content of the breast muscle. (iv) tended to give the lowest dressing %; apart from this, differences in carcass and meat composition were small. AJDW

109

[Use of prepared full-fat rapeseed in diets for broilers.]

Kroliczek, A.; Kinal, S.; Gwara, T.; Mazanowska, A.

Roczniki Naukowe Zootechniki, Monografie i Rozprawy No. 13, 25-36 (1979) [21 ref. Pol, en, ru] [Inst. Zywienia Zwierzat i Gospodarki Paszowej, 50-375 Wroclaw, Poland]

Two 8 wk feeding trials were conducted using a total of 1350 Dominant White Cornish × White Rock broilers. Diets studied were: (i) control diet; and diets with part of the soybean meal replaced by (ii) 5% acid-treated rapeseed, (iii) 10% acid-treated rapeseed, (iv) 10% raw rapeseed or (v) 5% rapeseed oil + 5% rapeseed meal. Tables of results are given, including data for dressing %, the % gizzard, proventriculus, liver, spleen and breast muscle in the carcass, and the DM, crude protein and crude fat contents of the breast muscle. In one of the feeding trials, diets (ii)-(v) gave significantly lower breast muscle % than diet (i), and diets (iii)-(v) gave significantly lower breast muscle % than diet (ii). Apart from this, no significant effects of the diets studied on carcass composition or meat quality were observed. AJDW

110

[Effects of processed rapeseed on digestibility coefficients and performance in broilers.]

Kroliczek, A.; Gwara, T.; Mazanowska, A.; Kinal, S.

Roczniki Naukowe Zootechniki, Monografie i Rozprawy No. 13, 11-24 (1979) [25 ref. Pl, en, ru] [Inst. Zywienia Zwierzat i Gospodarki Paszowej, 50-375 Wroclaw, Poland]

570 Dominant White Cornish × White Rock broilers were used in an 8-wk feeding trial to evaluate effects of substitution of acid-treated rapeseed for soybean meal in the diet on performance and carcass quality. 5 diets were used: (i) a control diet, and diets with (ii) 5%, (iii) 10% or (iv) 15% acid-treated rapeseed, or (v) 10% rapeseed meal. Tables of results are given, including data for carcass composition (carcass yield, and % gizzard, liver, spleen and breast muscle) and chemical composition (DM, crude protein, crude fat) of the

breast muscle. Overall carcass and meat quality was lowest for the group fed (iv). AJDW

111

Nonenzymatic browning reactions in breaded fried chicken and in model food systems.

Abu, M. Y. B.

Dissertation Abstracts International, B 40 (4) 1611: Order no. 79-21952, 125pp. (1979) [En] [Louisiana State Univ. & A&M Coll., Baton Rouge, Louisiana 70803, USA]

Effects of incorporation of buttermilk solids (BMS) in the batter formula on the final colour of fried battered/breaded chicken portions were studied. Chicken portions were precooked by boiling for 15 min, drained, cooled to 40°F, coated with a batter incorporating ≤20% BMS, breaded with cracker crumbs, blanched in soybean oil at 395°F for 20 s, packaged in polyethylene bags, frozen, stored at -4°F for 30 days, then deep-fat fried in soybean oil at 360°F for 6 min. Products made with batter containing 20% BMS had higher yield, higher moisture content and higher % crust than control samples; the BMS imparted a desirable 'buttery' flavour to the fried product. However, incorporation of 20% BMS caused an undesirable dark colour of the product, attributable to non-enzymic browning. This could be controlled by incorporation of up to 2500 p.p.m. sodium metabisulphite in the batter. The relative importance of various browning reactions in the skin/batter system is discussed. Caramelization was the most prevalent during the deep-fat frying process, and accentuated effects of other browning reactions, especially the Maillard reaction. In model systems, the relative rate of reaction of reducing sugars with casein was galactose > glucose > lactose. Maillard reaction browning rate was dependent on temp., moisture content and a_w . Browning rate of systems containing glucose or galactose was max. at a_w 0.62-0.84, vs. 0.62-0.75 for systems containing lactose. AJDW

112

Chemical composition and yield of Cornish game hens and broilers.

Simpson, M. D.; Goodwin, T. L.

Poultry Science 58 (5) 1400-1402 (1979) [12 ref. En] [Dep. of Anim. Sci., Univ. of Arkansas, Fayetteville, Arkansas 72701, USA]

Chemical composition and yield data were compared for male and female chicken carcasses classed as Cornish game hens and broilers. The Cornish game hens ranged in wt. from 501.6 g to 647.5 g depending on the sex of the individual. The broilers averaged 1010 g for the females and 1130 g for the males. Light meat was higher in moisture and protein content, whereas dark meat was higher in fat and ash. As the % moisture and protein increased, fat % decreased in the light meat. Fat content of the meat was the most variable component studied. Females yielded a higher % of light meat, and males produced a larger % of dark meat. AS

113

Fiber types in skeletal muscles of broiler- and layer-type chickens.

Aberle, E. D.; Addis, P. B.; Shoffner, R. N.
Poultry Science 58 (5) 1210-1212 (1979) [10 ref. En]
[Dep. of Food Sci. & Nutr., Univ. of Minnesota, St. Paul, Minnesota 55108, USA]

Distribution of muscle fibre types (α R, α W, and β R) and fibre size was compared in broiler-type and layer-type chickens at 4 wk of age. Broiler chickens had a lower % of α fibres, but a higher proportion of the α fibres were in the α W class. Both α and β type fibres had larger diam. in broiler chickens. The results suggest that the meat of broiler-type chickens may be lighter in colour because the muscles are more anaerobic. AS

114

Egg weight and gamma-rays effects. III. Meat, carcass and blood analysis.

Shebaita, M. K.; Kamar, G. A. R.; Salem, M. A. I.; Ezzat, I. E.

Archiv für Geflügelkunde 43 (4) 165-175 (1979)
[27 ref. En, de, fr, ru] [Coll. of Agric., Cairo Univ., Giza, Egypt]

This paper includes tables of data for carcass quality (carcass yield, eviscerated wt., bone %, meat %, and the moisture, fat, protein and ash contents of the meat) of 180 36-wk-old roosters, hatched from eggs of 2 wt. grades, (i) 36-43 and (ii) 44-50 g, non-irradiated or subjected to γ -irradiation at 150-750 rad; data are presented for 3 body wt. groups (low, medium and high). The effects of egg wt. and egg irradiation on the characteristics studied are discussed. Irradiation tended to increase carcass yield, eviscerated wt. and bone and meat % in the carcass in (ii), but to decrease these characteristics in (i). Irradiation of the eggs increased fat content in meat of both (i) and (ii); protein content of (i) decreased and that of (ii) increased with increasing irradiation dose. Ash content of (i) increased and moisture content of (ii) decreased with increasing irradiation dose. [See *Archiv für Geflügelkunde* (1979) 43, 97-107 for part II.] AJDW

115

[Protein quality of the H_2 -oxidizing bacterium *Alcaligenes eutrophus* in fattening of broilers. I. Effects of graded substitution of bacterial biomass for soybean meal on growth and feed utilization.]
Proteinqualität des H_2 -oxidierenden Bakterienstammes *Alcaligenes eutrophus* in der Broilermast. I. Wachstum und Futterverwertung bei steigendem Austausch von Sojaextraktionsschrot durch die Bakterienmasse.
Greife, H.; Molnar, S.; Günther, K.-D.
Archiv für Geflügelkunde 43 (4) 129-138 (1979)
[21 ref. De, en, fr, ru] [Inst. für Tierphysiologie & Tierernährung, Univ., Göttingen, Federal Republic of Germany]

420 Lohmann hybrid male broilers were used in 4-wk feeding trials on diets with 10, 20, 30, 45 or 60% of dietary protein derived from *Alcaligenes eutrophus* PHB-4 H 16 biomass (substituted for soybean meal.) Tables of data are given for survival, growth and feed utilization of the broilers, together with the taste of the

meat. No adverse effect of feeding the bacterial protein on the taste of broiler meat was observed. AJDW

116

Effects of rapeseed meal on broilers: studies of meat flavour, liver haemorrhage and trimethylamine oxidase activity.

Griffiths, N. M.; Fenwick, G. R.; Pearson, A. W.; Greenwood, N. M.; Butler, E. J.

Journal of the Science of Food and Agriculture 31 (2) 188-193 (1980) [23 ref. En] [Food Res. Inst., Colney Lane, Norwich, Norfolk NR4 7UA, UK]

Inclusion of 10% of a high glucosinolate *Brassica napus* meal in the diet of 3 popular broiler strains for 3 wk or 6 wk from 1-day-old did not affect the flavour of the meat or exacerbate liver haemorrhage. In 1 strain the activity of hepatic trimethylamine oxidase fell by 50% but did not reach the levels present in hens laying tainted eggs. Body wt. was reduced by about 7-11% and the relative wt. of the liver was increased by about 9-14%. AS

117

Significance of hemolytic activity of some radiation-resistant micrococci in food.

Welch, A. B.; Maxcy, R. B.

Applied and Environmental Microbiology 38 (5) 902-905 (1979) [9 ref. En] [Dep. of Food Sci. & Tech., Univ. of Nebraska-Lincoln, Lincoln, Nebraska 68583, USA]

Micrococci resistant to 1 Mrad of γ -radiation were isolated from irradiated chicken. 3 isolates were haemolytic on blood agar plates and were selected for further study. 2 other radiation-resistant micrococci, *Micrococcus radiodurans* and *M. radiophilus*, were included in the study because there is only a very limited amount of information regarding haemolytic activity of these organisms and their potential role of public health importance. Tests to determine haemolytic patterns, haemolytic activity of extracellular substances, leukocytic activity, presence of enzymes commonly associated with pathogenicity (coagulase, deoxyribonuclease, phosphatase), and pathogenicity for laboratory animals all suggested that the organisms would not be of public health significance. AS

118

The influence of quality of selected wines on the sensory characteristics of lobster bisque, poached breast of chicken, and coq au vin.

Bell, D. A.

Dissertation Abstracts International, B 40 (3) 1106:
Order no. 79-21134, 168pp. (1979) [En] [Michigan State Univ., East Lansing, Michigan 48824, USA]

California dry sherry, dry cooking sherry and Spanish dry fino-type sherry, were added to cooked lobster bisque. Evaluation of the bisques by a consumer panel indicated that those flavoured with California and cooking sherries were preferable to that flavoured with Spanish sherry. A second study involved poaching chicken breasts in white wines (inexpensive 'jug'-type wine, cooking wine, premium wine) and in chicken stock; sauces were also prepared with each of the 3 wines. The cooked breasts and sauces were evaluated for aroma, flavour and colour by a trained sensory

panel; breast juiciness and tenderness were evaluated by objective methods. Results indicated that the sensory quality of breasts was similar with all 3 wines and with stock; it is therefore concluded that wine quality has a negligible effect on the sensory quality of poached chicken breasts. A similar study involved braising chicken thighs in red wines (inexpensive 'jug'-type wine, cooking wine, premium wine) and in chicken stock and preparation of sauces with the wines. Sensory evaluation indicated that product quality was similar with all 3 wines but that wine-braised thighs were preferred to stock-braised thighs. Type of wine had little effect on the sensory quality of red wine sauce. JA

119

Hand breeder.

Reece, V. E.

United States Patent 4 182 260 (1980) [En]

A breeding apparatus comprises a table structure, on which is sited an open top breeding pan having a central opening in the bottom with a removeable closure so that flour or the like may be deposited in the pan and pieces of foods, such as chicken, may be placed in the flour and by manual manipulation, covered with the flour. A removable catch pan below the breeding pan, and a sifter apparatus between the breeding pan, and the catch pan are also incorporated. HBr

120

[The emulsifying properties of chicken plasma.] Zur Emulgierungskapazität von Hühnerplasma.

Ehinger, F.; Townsend, W. E.

Fleischwirtschaft 60 (2) 278-281 (1980) [many ref. De, en] [Univ. Hohenheim, Postfach 106, D-7000 Stuttgart 70, Federal Republic of Germany]

A modification of Swift's method (*Food Technology* (1961) 15, 463-473) was used to examine the effects of treatment (fresh, frozen, freeze-dried), pH (4, 5, 6, 7, 8, 9) and protein concn. (0.2, 0.4, 0.6, 0.8 and 1.0%) of chicken plasma on its emulsifying properties in a model system by a trifactorial experiment. Results, shown graphically and in a table, revealed that frozen plasma had somewhat poorer emulsifying capacity than fresh or freeze-dried plasma. The emulsifying capacity increased with rise in pH; this accounted for >50% of the variance for ml oil emulsified/ml plasma solution and % oil in the emulsion at collapse. The absolute amount of oil emulsified was only slightly affected by the concn. of the plasma solution; if, however the data are related to the amount of protein (i.e. ml oil emulsified/g protein), about 5 times as much oil was emulsified at the lowest as at the highest concn. For this characteristic, the concn. factor accounted for >90% of the variance. Apart from the interaction pH \times concn., the interactions accounted only for small % of the variance. RM

121

Microbial proteases and their effect on food proteins. Sikes, A.

Dissertation Abstracts International, B 40 (6) 2543:

Order no. 79-26 343, 109pp. (1979) [En] [Univ. of

Nebraska, Lincoln, Nebraska 68503, USA]

Studies on the proteolytic activity of 122 isolates of spoilage bacteria from chicken are described. Ability of the isolates to hydrolyse 4 unfractionated proteins (egg albumen, gelatin, casein, and beef sarcoplasmic proteins) and 3 casein fractions (α_1 -, β - and κ -) was determined. 3 patterns of proteolytic activity were observed: some isolates hydrolysed all the proteins; some hydrolysed some but not all of the proteins; and some hydrolysed none of the proteins. Within isolates, ability to hydrolyse denatured proteins did not differ significantly from ability to hydrolyse undenatured proteins. It is concluded that use of a single protein substrate is likely to give an inaccurate impression of the proteolytic activity of bacterial isolates. Studies were conducted on invasion of meat by *Serratia marcescens*. In comminuted beef and pork, invasion was increased if the meat had been subjected to at least 1 freeze-thaw cycle. Addition of sodium tripolyphosphate reduced invasion of comminuted beef or pork. Cooked intact beef was more susceptible to invasion than raw beef; meat cooked to an end point temp. of 170°F was less resistant to bacterial invasion than that cooked to 145°F. Fibre orientation was of significance for the final depth of penetration of invading bacteria. It is concluded that bacterial invasion is not a function of the collagenolytic activity of bacterial proteases. Invasion was found to be strongly influenced by hydration of meat proteins, and availability of pores or canals formed during cooking or as a result of freezing and thawing. AJDW

122

Sewage sludge and seaweed (*Ulva* sp.) as supplementary feed for chicks.

Wong, W. H.; Leung, K. L.

Environmental Pollution 20 (2) 93-101 (1979) [13 ref. En] [Dep. of Biol., Chinese Univ. of Hong Kong, Shatin, NT, Hong Kong]

Groups of chickens, 53 days of age at the start of the trial, were used in 35-day feeding trials conducted to evaluate effects of supplementation of maize-based diet with 5, 15 or 25% of either (i) dried *Ulva* sp. or (ii) dried sewage sludge on performance and carcass quality. A control group was fed a diet containing a commercial concentrate mixture. Tables of results are given, including data for protein content of the pectoral muscle, dressed carcass wt, gizzard wt., and gizzard and liver as % of body wt. The results showed no significant effect of dietary *Ulva* sp. or sewage sludge on the carcass characteristics studied. AJDW

123

New feedstuffs in poultry nutrition.

Masloboyev, A. Y.; Bakhtin, I. A.; Lobin, N. V.;

Pavlov, V. A.

Poultry International 17 (8) 40, 42, 61, 63 (1978); [En, de, fr, es, it, ja, ar] [All. Union Poultry Res. & Tech. Inst., USSR]

Feeding trials conducted to evaluate effects of a milk protein preparation (obtained by precipitation of proteins from skim milk with Ca salts) on performance and carcass quality of Baltika-6 broilers showed that substitution of the milk protein product for 50% fish

meal in the diet improved wt. gain and % first-class carcasses. Feeding trials on Start-I laying hens showed substitution of a hydrolysed meat, skin, tendon, bone etc. product for fish meal in the diet did not adversely influence performance or viability of the hens; however, it increased lipid content of the liver by 2.5–5.6%.
AJDW

124

Salmonella on broiler carcasses as affected by fresh water input rate and chlorination of chiller water.

Thomson, J. E.; Bailey, J. S.; Cox, N. A.; Posey, D. A.; Carson, M. O.

Journal of Food Protection 42 (12) 954–955, 967 (1979) [24 ref. En] [Richard B. Russell Agric. Res. Cent., USDA, PO Box 5677, Athens, Georgia 30604, USA]

Broiler carcasses, each inoculated with about 1000 cells of a marker strain of *Salmonella typhimurium*, and uninoculated carcasses were prechilled and chilled in a simulated commercial chilling process. For each experiment, fresh water input was either 1.90 l Cl₂ (0.50 gal) or 0.95 l (0.25 gal)/carcass, and the Cl₂ level was 0, 20 or 50 p.p.m. The rate of fresh water input had no significant effect on either cross-contamination (uninoculated carcasses showing contamination with marker organisms after chilling) or elimination of *Salmonella* from the inoculated carcasses. Fewer uninoculated carcasses showed marker *Salmonella* contamination after chilling with 50 p.p.m. of Cl₂ than 0 p.p.m., but cross-contamination was not eliminated. Cl₂ in the chilling water decreased rapidly due to the effect of organic matter. AS

125

[Chilling, freezing and storage of poultry.] Kühlen, Gefrieren und Lagern von Geflügel.
Ristic, M.

Kälte 32 (11) 592–594, 598, 600; (12) 668, 670, 672, 674 (1979) [15 ref. De] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

Tabulated data show the effects of chilling method, of storage time and temp. and of repeated freezing and thawing on chemical, physical and sensory characteristics of chilled and frozen broilers and broiler portions. Fresh carcasses could be stored for 12 days at $\pm 1^\circ\text{C}$. Frozen portions prepared from thawed carcasses (previously stored for up to 11 months at -18°C) could be stored for a further 3 months at -12° or 4 months at -18°C , provided carcasses were thawed slowly (38–40 h at $4-5^\circ\text{C}$), cut and packaged at $16-18^\circ\text{C}$ within $1\frac{1}{2}$ h and immediately refrozen. The stored frozen portions had lower peroxide numbers if fresh carcasses were chilled by air (tunnel) cooling and better overall sensory properties after water cooling. For preparing frozen portions, fresh broilers should be stored for ≤ 6 days. During up to 10 months' storage, at -15° or -21°C , of frozen broiler portions, storage time had a greater effect than temp. on quality. RM

126

[Effects of rye alkylresorcinols on growth of chickens.]

Pawlik, J.

Roczniki Naukowe Zootechniki, Monografie i Rozprawy No. 13, 121–138 (1979) [28 ref. Pl, en, ru] [Inst. Zootech, Cent. Sta. Oceny Pasz, Czechnica, 55-011 Siechnice, Poland]

Groups of 20 Dominant White Cornish \times White Rock broilers were used in a 4-wk feeding trial conducted to evaluate effects of rye alkylresorcinols on performance and carcass quality. 5 diets were tested: (i) ground maize + wheat (control); (ii) ground maize + wheat extracted with acetone; (iii) ground wheat + ground rye, both extracted with acetone; (iv) as (iii) but with addition of 0.02% pure alkylresorcinol; and (v) as (iii) but with addition of 0.04% pure alkylresorcinol. Tables of results are given, including values for the drawn carcass yield, liver %, gizzard fat %, breast muscle %, and the DM, crude protein, ether extract and crude ash contents of the breast muscle. The results show diets (iii), (iv) and (v) to give significantly lower drawn carcass yield than (i) and (ii), and diets (iv) and (v) to give significantly lower liver % than diets (i)–(iii). No significant effects on the other carcass and meat quality characteristics studied were observed. AJDW

127

[Effect of protein concentrates on organoleptic and chemical characteristics and biological value of canned poultry meat.] [Lecture]

Gonotskii, V. A.; Seredenko, L. D.; Rostrosa, N. K.; Petrovskii, K. S.; Khovaeva, L. A.

Proceedings of the European Meeting of Meat Research Workers No. 24, K11:1–K11:6 (1978) [6 ref. Ru, de en, fr] [Nauchno-Proizvodstvennoe Ob'edinenie Ptitsepererabatyvayushchei, & Kleezhelatinovoi Promyshlennosti 'Kompleks', Moscow, USSR]

Canned chicken-meat pates were made with 0, 2.5, 5.0, 7.5 or 10% of the blanched meat (64.5% moisture, 20% protein) replaced by a milk protein concentrate (9.4% moisture and 74.1% protein); or with the same proportions replaced by mixtures of sodium caseinate (6.0% moisture, 86.0% protein) or the casein preparation 'Kazetsit' (8% moisture, 78% protein) with soy protein (7% moisture, 84% protein) in the ratios 30:70, 50:50 or 70:30. Proximate composition of canned products with 5% addition of protein concentrates are given, together with biological values and true digestibilities of canned products with different % additions of 'Kazetsit' or milk protein concentrate, determined on rats. It is concluded that, from the viewpoints of organoleptic quality and biological value, 5% inclusion of protein concentrates in canned chicken meat pates has a valuable effect. [See FSTA (1980) 12 8S1280.] SKK

128

[Effect of length of storage before thawing and after re-freezing on broiler meat quality.] Auswirkungen der Lagerdauer vor dem Auftauen und nach erneutem Einfrieren auf die Fleischbeschaffenheit von Broilern. [Lecture]

Ristic, M.; Schön, L.

Proceedings of the European Meeting of Meat Research Workers No. 24, D2:1–D2:6 (1978) [6 ref. De, en, fr, ru] [Bundesanstalt für Fleischforschung, Kulmbach, Federal Republic of Germany]

560 broiler carcasses (Lohmann strain) were packaged after water cooling in polyethylene bags, shock-frozen at -38°C for 3 h, and stored at -18°C or below. Batches of 80 were thawed at 4°C for 38 h after storage for 0, 1, 2, 3, 6, 9 or 11 months, and cut up; portions of 2 breasts and 2 legs were re-packaged in PVC film, re-frozen at -38°C for 3 h, stored at $-12 \pm 1^{\circ}$ or $-18 \pm 1^{\circ}\text{C}$, and thawed at 4°C for about 22 h after 1, 2, 3 or 4 months. pH, consistency (using the rigometer of Sybesma [*Fleischwirtschaft* (1966) 46, 637]), freezer burn, colour (visually), and peroxide and aldehyde values of fat were determined; and juiciness, tenderness, aroma and taste were assessed by a panel after grilling the portions in Al foil at 220°C . Mean values for the various characteristics measured and results of analysis of variance are tabulated in detail. Sensory changes became evident in leg meat within 3 and in breast meat within 4 months after re-freezing; and fat characteristics began to deteriorate 2 months after re-freezing; the total shelf life of broilers stored frozen for ≤ 3 months was thus 6-7 months, and was 12-14 months for those stored frozen for 6-11 months. [See FSTA (1980) 12 8S1280.] SKK

129

[Effect of pre-slaughter stress on blood coagulability and plumage tenacity in broilers.] [Lecture] Shumkov, E. G.; Gorbataya, N. P.; Ivanova, T. V.; Solov'ev, V. G.

Proceedings of the European Meeting of Meat Research Workers No. 24, A13:1-A13:6 (1978) [6 ref. Ru, de, en, fr] [Nauchno-Proizvodstvennoe Ob"edinenie Ptitsepererabatyvayushchei i Kleezhelatilnoi Promyshlennosti 'Kompleks', Moscow, USSR]

Effect of stress during catching and caging, transport, and suspension for slaughter was measured in groups of 3-10 broilers by measurement of (i) catecholamine content of blood, (ii) blood coagulability, and (iii) (after suspension only) plucking resistance of randomly selected back feathers (using a special device). In comparison with control birds, (i) increased resp. by 41, 14 and 116% after catching, after transport, and after suspension; (ii) increased by 72 and 63% resp. after catching and suspension, but decreased by 43% after transport; and (iii) increased by 63% after suspension. [See FSTA (1980) 12 8S1280.] SKK

130

Metabolic fate of the herbicide buthidazole in lactating cows and laying hens.

Atallah, Y. H.; Yu, C. C.; Whitacre, D. M.

Journal of Agricultural and Food Chemistry 28 (2) 278-286 (1980) [2 ref. En] [Res. & Development Dep., Velsicol Chem. Corp., Chicago, Illinois 60611, USA]

[^{14}C]Buthidazole [3-(5-(1,1-dimethylethyl)-1,3,4-thiadiazol-2- ^{14}C -yl)-4-hydroxy-1-methyl-2-imidazolidinone] was administered in twice-daily oral doses for 14 consecutive days to cows at dosages equivalent to 0.5, 2.5, and 10 p.p.m., in the diet and to hens at dosages equivalent to 0.3, 1.5, and 6 p.p.m. in the diet. Within 12 h of the final [^{14}C]buthidazole dose, 80% of total administered ^{14}C was excreted in cow urine, 8% in faeces, and 1% in milk; 82% was eliminated in hen

excreta. Residues, as a function of dietary concn., were about 1.4% for milk, 0.4% for eggs, 2% for cow muscle, and 0.2% for hen muscle. No residue was detected in milk, eggs, or tissues 7 days after treatment ceased. AS

131

Metabolism of [^{14}C]zearalenone in laying hens.

Dailey, R. E.

Journal of Agricultural and Food Chemistry 28 (2) 286-291 (1980) [8 ref. En] [Div. of Toxicology, FDA, Beltsville, Maryland 20705, USA]

A single dose of 10 mg [^{14}C]zearalenone/kg was administered by gavage to White Leghorn laying hens, and its absorption, distribution, and excretion at 2, 4, 24, 48, and 72 h after dosage were studied. ^{14}C -Labelled residues in excreta, bile, egg yolk, clutch, and liver were partially characterized. No major retention sites of ^{14}C activity were found in edible muscle tissues but persistent levels of lipophilic metabolite(s) were detected in egg yolk at a concn. of 195 $\mu\text{g-equiv./100 g}$ wet wt. (about 2 p.p.m.) 72 h after dosing. AS

132

Replacement of cereal (sorghum) with rice-polishings in broiler rations.

Ahmad, M. R.; Abid, A. R.; Khan, M. A.; Ghaffar, A.; Ullah, M.

Journal of Agricultural Research, Pakistan 15 (4) 351-357 (1977) [6 ref. En] [Dep. of Nutr., Univ. of Agric., Faisalabad, Pakistan]

120 day-old chicks were fed to 8 wk on diets of 40, 30, 20, 10 and 0% sorghum, with, resp., 0, 10.6, 21.0, 31.8 and 42.4% rice polishings. Tabulated data for effects on growth, feed intake, feed efficiency and dressing % showed no significant differences in dressing % between birds fed the various diets studied. RM

133

Modified pulse polarographic determination of nicarbazin in chicken tissue at the 0.1-p.p.m. level.

Wood, J. S., Jr.; Downing, G. V.

Journal of Agricultural and Food Chemistry 28 (2) 452-454 (1980) [4 ref. En] [Merck Sharp & Dohme Res. Lab., PO Box 2000, Rahway, New Jersey 07065, USA]

The method described was devised to extend the assay of nicarbazin residues in chicken tissues by pulse polarography down to the 0.1-p.p.m. level generally required by regulatory agencies. The 4,4'-dinitro-carbanilide portion of the complex is extracted with ethyl acetate. After removal of solvent, kidney and liver samples are cleaned up by a series of hexane washes of acetonitrile and acetonitrile/water solutions containing a small amount of dimethyl sulphoxide (Me_2SO), followed by extraction into methylene chloride. The methylene chloride is removed and pulse polarograms obtained on the residue are dissolved in Me_2SO electrolyte after washing with hexane/toluene. For skin-fat and muscle, the acetonitrile/methylene chloride cleanup is unnecessary. The resulting polarograms were essentially clean for tissues from nonmedicated chickens, and recoveries of added drug at the 0.1-0.4-p.p.m. level averaged 73% for liver (range 65-87), 76% for kidney (58-84), 85% for muscle (77-102) and 94% for skin-fat (79-106). AS

134

Experiences on the storage of meats and poultry in controlled atmospheres. [Lecture]

Partmann, W.

Bulletin de l'Institut International du Froid 59 (4) 1156-1159 Abstr. C2-12 (1979) [En, Fr] [Fed. Res. Cent. for Nutr., Karlsruhe, Federal Republic of Germany]

A new vacuum packaging storage method was tested using 400 beef steaks, 180 veal chops, 180 pork chops and halves of 120 freshly slaughtered broilers. Samples were packed in high-density polyethylene bags with a small excess pressure of the atm to be tested and stored at 1°C for up to 6 wk in gas-tight containers at a pressure of 1.8 bar of the same gas. Atm used were air, 20% CO₂ + 80% N₂, and pure CO₂. Of samples stored in air, the beef steaks had generally turned brownish-red after 4 wk and were unsaleable according to microbiological, chemical and sensory findings; a large part of the other 3 sample types were spoiled after 2 wk storage. From the microbiological, chemical and sensory viewpoints, storage in the 2 CO₂-containing atm gave storage times of 6 wk for beef steaks and 4 wk for the other 3 sample types. With pure CO₂, pork and veal chops could be stored even for 6 wk with all quality criteria, including colour, maintained. The superiority of pure CO₂ over the gas mixture became obvious after samples were unpacked and after-stored at refrigerator temp.; broilers kept in CO₂ for 4 wk were still of sufficiently good quality after 5 days storage at 4°C, while those stored in the gas mixture showed a much more rapid quality loss during a subsequent cold storage period. [See FSTA (1980) 12 9G615.] AL

135

Effect of oven holding on qualities of fried chicken parts.

Yang, C. S.; Chen, T. C.

Journal of Food Science 45 (3) 635-637 (1980) [En] [MAFES, Poultry Sci. Dep., Mississippi State Univ., Mississippi 39762, USA]

8-piece-cut broiler parts from 907-1134 g carcasses were obtained from a processing plant. Parts were flour predusted, battered, and floured again before being fried in a deep-fat fryer. Fried chicken parts were immediately held in an electric oven at 65.6°C. Warner-Bratzler shear values, ultrastructural changes, coating-skin moisture contents, and organoleptic evaluations of the fried parts were measured after 0.25, 1, 2, and 3 h of holding. Both breast and thigh meat had a change in ultrastructure at different times; however, dark meat became tougher sooner than white meat. Oven holding had a drying effect on the coating-skin portions. Organoleptic scores of coating-skin parts of fried chicken were not affected by holding time within 3 h, while those for meat parts were affected. IFT

136

Influence of certain air chilling conditions on the later storage life of poultry carcasses. [Lecture]

Lahellec, C.
Bulletin de l'Institut International du Froid 59 (4) 1194-1197 Abstr. C2-119 (1979) [En, Fr] [Sta. Exp. d'Aviculture, 22440 Ploufragan, France]

120 hot packaged chicken carcasses were divided into

2 groups, one for a freezing room at -11°C for 3 h, the other for a conventional chilling room at 2°C for 5 h. Bacteriological analysis of all carcasses was carried out prior to storage and after 7, 10, 14 and 17 days of cold storage, but no difference was established between the 2 modes of chilling. [See FSTA (1980) 12 9G615.] AS

137

Quality and sensory characteristics of mechanically deboned spent layer meat chilled with liquid nitrogen and carbon dioxide "snow".

MacNeil, J. H.; Mast, M. G.

Journal of Food Science 45 (3) 645-647, 651 (1980)

[En] [Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

Mechanically deboned spent layer [chicken] meat (MDSLM) was chilled with liquid nitrogen (LN₂) or CO₂ snow and frozen in an air blast freezer. Samples of this material were held at either 2°C for 8 days of storage or -18°C for up to 6 months of frozen storage. CO₂-treated samples held for 8 days at 2°C had higher thiobarbituric acid (TBA) values and higher expansion values than LN₂-treated samples. No differences in TBA value or can pressure were noted for samples stored at -18°C. LN₂- and CO₂-treated samples were less pink than control samples after 6 months storage at -18°C. Chilling with LN₂ and CO₂ and holding at 2°C resulted in increased shelf life as evaluated by a sensory panel; the opposite effect was noted for storage at -18°C. Samples stored at 2°C showed comparable numbers of microorganisms but resulted in different sensory properties. IFT

138

Effects of carbon dioxide and nitrogen atmospheres on the quality of mechanically deboned chicken meat during frozen and non-frozen storage.

Jurdi, D.; Mast, M. G.; MacNeil, J. H.

Journal of Food Science 45 (3) 641-644, 666 (1980)

[En] [Dep. of Food Sci., Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

Effects of different storage atm. (100% CO₂, 30% CO₂, N₂, or air) on several characteristics of high-fat and low-fat mechanically deboned chicken meat (MDCM) were investigated. Samples were stored at 5°C for up to 10 days or at -20°C for 2 months. The use of 100% CO₂ repressed the total aerobic bacterial numbers of MDCM when held at 5°C. Numbers of anaerobic organisms were reduced for only the high-fat MDCM stored at 5°C. Thiobarbituric acid values of high-fat MDCM stored under N₂ at 5°C and -20°C were lower than those of all other treatments. Storage under CO₂-enriched atm caused significant ($P < 0.05$) decreases in pH. However, this effect was not apparent after prolonged storage. Gardner L values of samples exposed to 100% CO₂ were higher and a⁺ values were lower than other treatment samples. % metmyoglobin in high-fat MDCM increased with storage time at -20°C. None of the samples showed any detectable metmyoglobin reducing activity. O₂ uptake rate after addition of high-fat MDCM homogenates decreased with time; no effect was observed with low-fat MDCM. Samples frozen immediately after treatment with the various gases had better keeping quality than those held for 3 days at 5°C prior to freezing. IFT

139

The influence of chilling method and packaging on the storage life of chilled broilers. [Lecture]
Bögh-Sørensen, L.

Bulletin de l'Institut International du Froid 59 (4) 1196-1197 Abstr. C2-15 (1979) [En, Fr] [Danish Meat Products Lab., 2000 Copenhagen, Denmark]

2 chilling methods were used, air chilling at 0°C for 30 min and immersion chilling, in a model counter-current system where the water temp. during 45 min was lowered from 14°C to 3.5°C. Broilers were packed in a polyethylene (PE) bag, in a food container with PVC over-wrap or vacuum packed. During storage at 2°C bacteriological analysis, odour evaluation and analysis of the air composition in the packages were performed. At 2°C the storage life was about 6 days in a PE-pouch, about 8 days in a food container with PVC over-wrap and about 10 days in a vacuum pouch, whereas the chilling method did not influence storage life. [See FSTA (1980) 12 9G615.] AS

140

Studies on the carcass quality and chicken meat production in cockerels of various commercial white Leghorn strains.

Singh, J.; Singh, G. S.

Indian Veterinary Journal 56 (5) 408-411 (1979) [8 ref. En] [Dep. of Anim. Husbandry & Dairying, UP Coll., Varanasi 221002, Uttar Pradesh, India]

Cockerels of 6 commercial White Leghorn strains (H.F.N. Nick Chicks, Parks Keystone, Thornber, Hisex-White, Shaver Star Cross-288, Arbor Acre) reared under similar conditions were slaughtered at the age of 17 wk. Studies were made of live wt., eviscerated (dressed) carcass wt., wt. of the edible portion and of other components (blood, head, shank, wings, various organs and offal), wt. and proportions of the various joints (neck, thigh, wings, trunk) in the dressed carcass, and wt. of muscle, bone and fat and their % of the total dressed wt. Results are tabulated. Differences between the 6 strains were generally insignificant, except for trunk wt. which was significantly ($P < 0.05$) higher in H.F.N. Nick Chicks, Hisex-white, Shaver Star Cross-288 and Arbor Acre than in the other 2 strains. An equation, $Y = 19.3X + 368.82$ (where Y represents the amount of edible meat and X represents the *tibiotarsus* length) was developed which allows prediction of the edible meat yield without killing the birds. JA

141

[Analysis of meat products: critical comparison of double immunodiffusion (DID) and cross-over (COE) methods for minimum antigen detection.]

Flego, R.; Borghese, R.

Bollettino dei Chimici dei Laboratori Provinciali 5 (5) 701-711 (1979) [5 ref. It, fr, en, de] [Lab. Chimico Provinciale di Udine, Via Colugna 42, 33100 Udine, Italy]

The sensitivities of DID and COE for detn. of proteins in fresh meat extracts were compared. Tabulated results obtained with pork, beef, horse meat and chicken extracts showed that DID identified the species at a dilution of 1:32, COE at a dilution of 1:1024; i.e. the limit

of sensitivity for the 4 species by DID was 2.5, 1.3, 2.8 and 1.5 µg, by COE 0.08, 0.04, 0.08 and 0.04 µg. COE is therefore 26-45 times as sensitive as DID. [See also FSTA (1978) 10 7A406.] RM

142

Proceedings of the Maryland Nutrition Conference for Feed Manufacturers, March 20-21, 1980. [Conference Proceedings]

United States of America, University of Maryland; United States of America, Maryland Feed Industry Council Inc.; United States of America, American Feed Manufacturers Association

iv + 80pp. (1980) [many ref. En] Maryland, USA; University of Maryland, Price \$2.50

Review papers presented at this conference included:

Animal products in the diet: challenges and opportunities, by O. D. Butler (p. 1). Factors affecting abdominal fat distribution and comparison of parts yield of broiler strains, by J. L. Heath (pp. 4-7, 3 ref.). Potential new uses for buffers in dairy cattle feeding, by R. A. Erdman (pp. 48-55, 20 ref.). USDA's action program for sulfamethazine residues, by L. T. Frobish (pp. 65-71). Suggested nutrient requirements for broiler breeder hens, by P. W. Waldroup (pp. 71-75, 6 ref.). Growth and milk yield response of dairy cattle to photoperiod, by R. R. Peters (pp. 75-80, 11 ref.). SP

143

[Determination of traces of growth-promoting oestrogens in meat by HPLC with voltammetric detection.] Spurenbestimmung östrogen wirkender Masthilfsmittel in Fleisch durch HPLC mit voltammetrischer Detektion.

Frischkom, C. G. B.; Smyth, M. R.; Frischkom, H. E.; Golimowski, J.

Zeitschrift für Analytische Chemie 300 (5) 407-412 (1980) [13 ref. De, en] [Inst. für Chem., Kernforschungsanlage Jülich (KFA), Postfach 1913, D-5170 Jülich, Federal Republic of Germany]

The voltammetric and chromatographic behaviour of the growth-promoting hormones oestrone, oestradiol, diethylstilboestrol, dienoeestrol, hexoestrol, zeranol and zearalenone was investigated. The voltammetric response was found to be most suitable for analytical purposes. A highly sensitive, fast and convenient method was developed for detn. of these compounds in meat by HPLC with voltammetric detection. In some cases this method offers additional possibilities for detn. of otherwise non-separable substances with sufficiently different oxidation potentials (60-90% recoveries were obtained for 800 pg oestrogens/g chicken meat). AS

144

Tissue residues and ultrastructural changes induced by DDT in chickens.

Reyes, M. de los; Mora, E. C.

Poultry Science 58 (5) 1183-1191 (1979) [18 ref. En] [Dep. of Poultry Sci., Alabama Agric. Exp. Sta., Auburn Univ., Auburn, Alabama 36830, USA]

Chickens were given DDT in an oral dose of 100 mg/kg body wt., 3 times a day for 10 days. Specimens of liver, pancreas, heart, skeletal muscle,

brain and sciatic nerve were obtained from morbid chicks for analysis of residue levels of DDT and its metabolites DDD and DDE, and for electron microscopic examination. Fat and sciatic nerve tissue contained the largest amount of DDT and metabolite residues; skeletal muscle and brain tissue contained the smallest amounts of residues. Total residue concn. in breast muscle of treated chick (wet wt. basis) was 135.44 p.p.m.; the corresponding value for fat was 8894.00 p.p.m. Control birds showed total residue concn. of 0.19 and 10.07 p.p.m. in these 2 tissues, resp. JRR

145

The development of chicken in the '80s.

Wilson, C.

Frozen Foods 32 (8) 17 (1979) [En]

Aspects considered are: the need for mandatory labelling to differentiate between grade A and B birds; problems of pricing frozen chickens, e.g. the impossibility of getting price labels to stick on or marker pens to stay legible, and the physical difficulty of handling frozen birds; advantages to the retailer of buying pre-priced chickens; an easy grip extension to the bag neck to make handling of frozen Suffolk Sovereign birds easier; and the pricing policy which can mean a near 2-oz give-away as sales are made in traditional 2 oz wt. ranges. AL

146

Mathematical equations describing chick performance and carcass composition as a function of diet protein and energy levels.

Nakhata, N.

Dissertation Abstracts International, B 40 (7) 2918: Order no. 79-17975, 141 pp. (1980) [En] [Utah State Univ., Logan, Utah 84321, USA]

The first objective of the studies was to compare the performance of chicks fed diets containing different known levels of protein and energy and to describe the relationships found by means of mathematical equations; a second objective was to calculate by means of regression analysis the amount of energy required for maintenance and for deposition of fat and protein. Results included the following. A diet containing 21-24% protein was required for max. wt. and protein gain; presence of fat in the diet tended to increase wt. gain but not protein gain. Carcass moisture levels and protein in DM increased with increasing protein levels in the diet but decreased when fat was added to the diet, while fat in DM decreased with increasing protein levels in the diet but increased on addition of fat to the diet. It is concluded that a diet containing 21-24% protein and 1-3% added fat would be most appropriate for broiler chicks during the first 3 wk of growth. The regression equations developed indicated that chick performance changed as the nutrient density of the diet increased, e.g. fat in the carcass increased, while carcass moisture and protein in DM decreased as nutrient density increased. JA

147

[Biochemical indices in blood, liver, kidneys and muscle of broilers.]

Cibulka, J.; Nemec, Z.; Petkov, S.; Sova, Z.; Zidek, V.; Trefny, D.

Sbornik Vysoke Skoly Zemedelske v Praze, Fakulta Agronomicka, B No. 29, 45-58 (1979) [23 ref. Cs, en, ru] [Katedra Vyzivy a Krmeni Hospodarskych Zvirat, Vysoka Skola Zemedelska, Prague-Suchdol, Czechoslovakia]

400 Ross-1 hybrid broilers were used in an 8-wk feeding trial conducted to evaluate effects of addition of a proprietary proteolytic enzyme preparation on biochemical indices of the tissues. 4 diets were tested: (i) control; (ii) control + 0.15% of the enzyme preparation under test; (iii) as (i), but with a reduced N content, and (iv) as (iii) with the addition of 0.15% of the enzyme preparation. Tables of data are given showing concn. of total protein and uric acid, and transaminase activities, in the blood, liver, kidneys and muscle tissue. The results show little difference in the biochemical indices between groups (i)-(iv). AJDW

148

Effect of preslaughter handling and slaughtering method of chicken on postmortem muscle biochemistry and meat quality.

Kim, B. K.; Lee, Y. B.

Korean Journal of Animal Science 21 (6) 515-522 (1979) [14 ref. Ko, en] [Korea Inst. of Sci. & Tech., Seoul, S. Korea]

Effects of preslaughter handling and slaughtering methods for chickens, at conventional chicken retail stores, in Seoul area, on postmortem muscle biochemistry and meat quality were studied. The following results were obtained; mean bleeding time was 66 s, ranging from 30 to 105 s; mean and range scalding temp. were 76°C and 65-85°C resp., scalding time also varied from 10-45 s, mean 19 s; aerobic plate counts on carcass skin and cutting table surfaces ranged from 12 000-157 000 cells/cm², and 2 900 000-10 700 000 cells/cm², resp.; breast muscle of market chickens had low levels of ATP and glycogen, compared with control chickens immobilized by electrical stunning and slaughtered by modern methods; shear values of cooked breast meat were 3.5 kg/cm² and 2.4 kg/cm² for the market and control chickens resp. From the results for market chickens it was concluded that total bleedout was not adequate, scalding temp. was too high, aerobic plate counts were high and attributed to unsanitary processing and handling conditions, ATP and glycogen levels were low reflecting preslaughter stress and improper slaughtering method, and that conventional slaughtering methods by local processors adversely affected meat tenderness. [From En summ.] SP

149

French fryer with a difference.

Henderson, P.

Food Processing Industry 49 (579) 25, 27, 30 (1980) [En]

A description is given of deep fryers developed by Erofa of Paris, France. The fryers make use of the principle of indirect heating, with separate boiler and heat exchanger. The complete line includes a boiler assembly (oil or gas fired) and a service platform with heat exchangers (straight stainless steel piping), pump, storage tanks and other accessories. Thermal oil circulates outside the pipes and frying oil inside; a 3 way valve regulating the thermal oil inside the exchanger. The valve controls the quantity and speed of thermal oil inside the exchanger resulting in min. variation in the working temp. Frying oil enters the fryer pan at a uniform rate through the main distribution box and after cooking, the frying oil leaves the fryer through a drum filter and if necessary through a filter press. Advantages of the fryer are: designed to save energy because of the high thermal efficiency; save cooking oil because they use the min. amount and there is absolute control of temp., oil flow, speed and level resulting in lower fatty acids and longer oil life; and save labour, since all controls are automatic. The Erofa fryer can handle breaded chicken, French fries, meat balls, vegetables, fish in tempura, and apple and pineapple slices. VJG

150

[Studies on metabolism of growth-promoting agents, using Nitrovin as a model substance. I. Tracer studies on absorption, distribution and excretion of ^{14}C -Nitrovin in rats, chicks and piglets.] Studien zur Stoffwechselwirksamkeit wachstumsfördernder Substanzen, durchgeführt an der Modellschubstanz Nitrovin. I. Tracerstudien zur Absorption, intermediären Verteilung und Ausscheidung von ^{14}C -Nitrovin bei Jungratte, Küken und Ferkel. Struck, S.; Meulen, U. ter; Hillemeir, H.; Günther, K. D. *Zeitschrift für Tierphysiologie, Tierernährung und Futtermittelkunde* 43 (4/5) 173-190 (1980) [23 ref. De, en] [Inst. für Tierphysiologie & Tierernährung, Univ., 3400 Göttingen, Federal Republic of Germany]

Studies were conducted on metabolism, tissue distribution and excretion of ^{14}C -Nitrovin administered orally to (i) rats, (ii) broilers (live wt. 550-600 g at the start of the trial) and (iii) German Landrace piglets (live wt. 12 kg at the start of the trial). Doses administered were 7 $\mu\text{Ci}/100\text{ g}$ body wt. for (i), 5 $\mu\text{Ci}/100\text{ g}$ body wt. for (ii) and 2.6 $\mu\text{Ci}/100\text{ g}$ body wt. for (iii). Tissues of (i) and (ii) were evaluated ≤ 12 days after Nitrovin administration; those of (iii) were evaluated ≤ 3 days after administration. Tables of data are given showing distribution of

^{14}C -Nitrovin activity in various tissues of the animals studied, and changes in residue distribution with time since administration. Most of the Nitrovin was excreted in the urine and faeces; of edible tissues, kidney and liver had the highest residual Nitrovin activity. Residues persisted in the tissues throughout the period studied. AJDW

151

[TLC determination of vinylphosphate insecticide residues in chickens and chicken meat.] Leshchev, V. V.; Frolov, B. A. *Khimiya v Sel'skom Khozyaistve* 16 (6) 71-72 (1978)

[3 ref. Ru] [VNII Vet. Sanit., USSR]

152

Estimation of carcass lipid deposition through incorporation of dietary margaric acid in chicks fed lard diet.

Takahashi, K.; Akiba, Y.; Matsumoto, T. *Japanese Journal of Zootechnical Science [Nihon Chikusan Gakkai-ho]* 51 (3) 197-203 (1980) [23 ref. En, ja] [Fac. of Agric., Tohoku Univ., Sendai-shi 980, Japan]

A total of 120 male White Leghorn chicks was used in a series of 14-day feeding trials conducted to evaluate effects of isocaloric isonitrogenous diets with (i) 60.83% glucose, no lard or (ii) 36.17% glucose, 10.60% lard on carcass lipid deposition. Some chicks were fed (i) or (ii) diets supplemented with lauric and margaric acids. Tables of data are given for: the fatty acid composition of the body fat of the chicks; rate of disappearance of lauric and margaric acids after withdrawal of supplements of these fatty acids; body wt. gain and protein and lipid retention; lipid deposition in the carcass; and effects of (i) and (ii) on incorporation of lauric and margaric acid into carcass lipids. Diet (ii) markedly increased carcass lipid deposition. Incorporation of margaric acid into carcass lipid was increased by diet (ii), this increase corresponding to the increased rate of lipid deposition. Diet had little effect on rate of disappearance of margaric and lauric acids from tissue lipids after withdrawal of dietary supplements of these 2 acids. The relative significance of deposition of preformed lipid vs. lipid synthesized de novo in chicks fed (i) or (ii) is briefly considered. AJDW

153

Electrical stunning of broilers: it's important in optimising bleed-out.

Kuenzel, W. J. *Poultry International* 18 (13) 38, 40 (1979) [En, de, fr, it, es]

Studies were conducted on electrical stunning of broilers; efficiency of stunning was evaluated on the basis of subsequent % bleed-out. Trials were conducted with plate and brine stunners. With the brine stunner, either alternating current (at voltages over the range 40-95 V) or direct current (at voltages over the range 40-200 V) were used. A table of results is given. The plate-type stunner gave inconsistent results attributable to poor contact between the bird and the plate. Brine stunning gave considerably better results. AC stunning gave better results than DC stunning, giving a 5% higher bleed-out. Recommended stunning voltages are 50 V for AC stunning and 90 V for DC stunning. Problems were experienced with electrical stunning of birds with thick foot scales; this problem could be eliminated by dipping or spraying the feet with water before stunning, to ensure adequate contact between the feet and the shackle. AJDW

154

Blisters and bruises in broilers.

Goodwin, T. L. *Poultry International* 18 (11) 14, 16 (1979) [En, fr, es, de, it]

Studies on the incidence and causes of down-grading of broiler carcasses because of breast blisters, bruising, etc. are briefly discussed. Examination of 443 457 birds at a processing plant showed the proportion downgraded for various defects to be: breast blister 10.3%; breast bruise 7.4%; broken wing 4.0%; and bruised wing 5.7%. Incidence of breast blister was influenced by breed, litter type and condition, number of broods grown on the litter and the crew that caught the broilers. The main factors influencing breast bruising were breed, health, litter condition, and the crew that caught the birds. The same breed had the highest incidences of both breast blisters and breast bruises. Health, litter condition and catching crew influenced incidence of broken wings. Only breed significantly influenced the incidence of wing bruises. AJDW

155

Effect of feed and water withdrawal.

Anon.

Poultry International 18 (11) 110, 112 (1979) [En]

Effects of withholding feed and water for a period before catching and slaughter on the wt. loss and carcass yield of broilers are discussed. Tables of experimental data are included. Live wt. tends to decrease slightly but eviscerated yield tends to increase as a result of withdrawal of feed and water before catching and slaughter. It is suggested that feed and water withdrawal 12 h before slaughter gives min. live wt. loss and max. eviscerated carcass yield. AJDW

156

Ammonia in the broiler house.

Fowler, J. C.

Poultry International 18 (11) 18, 20 (1979) [En, de, it, es, fr]

Effects of NH_3 concn. in the air in broiler houses on the performance and carcass quality of broilers were investigated; studies were conducted on NH_3 concn. of (i) 0, (ii) 25 or (iii) 50 p.p.m. A table of data is given including the following for (i), (ii) and (iii) resp.: incidence of breast blisters 3.4, 14.0 and 11.9%; total undergrades 5.1, 20.5 and 20.0%; total condemnations 0.6, 5.2 and 5.3%, and air sac condemnations 0, 3.5 and 4.1%. The desirability of minimization of NH_3 concn. in the air in broiler houses is briefly discussed. AJDW

157

An epidemiological study of salmonellae in broiler chicken production.

McGarr, C.; Mitchell, W. R.; Carlson, H. C.; Fish, N. A. *Canadian Journal of Public Health* 71 (1) 47-57 (1980) [51 ref. En, fr] [Vet. Res. Lab., Dep. of Agric., Abbotstown, Castleknock, Co. Dublin, Irish Republic]

The prevalence and dissemination of salmonellae in a selected area of the broiler chicken industry in Ontario, Canada, was ascertained. It was often observed that chicken breeder flocks were infected. 1 in 5 infected breeder flocks was associated with vertical transmission of salmonellae to its progeny at the hatchery. Half the broiler chicken flocks were infected with salmonellae whose source was undetermined. Infected broiler flocks introduced salmonellae to the processing plants.

Dissemination of salmonellae occurred in all plants studied. Carcass contamination frequently increased during processing, largely due to chiller tanks. Many of the *Salmonella* serotypes found on carcasses at consumer outlets were similar to those found on broiler flock farms. A total of 228 *Salmonella* isolates were recovered from 7875 samples examined. AS

158

Vitamin B₆ and niacin contents of broiler meat of different strains, sexes, and production regions.

Ang, C. Y. W.

Journal of Food Science 45 (4) 898-900 (1980) [En] [USDA, Richard B. Russell Res. Cent., SEA-AR, Athens, Georgia 30604, USA]

Broilers of 2 strain crosses, of both sexes and from 3 production regions, were analysed for their total vitamin B₆ and niacin contents. Overall average values and s.d. for breast meat without skin on a wet basis were 0.583 ± 0.045 mg/100 g for B₆ and 11.39 ± 0.79 mg/100 g for niacin. Vitamin B₆ content of thigh meat was 0.257 ± 0.020 mg/100 g and niacin content was 5.21 ± 0.60 mg/100 g. Broilers from 1 production region had up to 16% less niacin and 10% less vitamin B₆ in the thigh and breast tissues than broilers from the other 2 regions. On regional average basis, 100 g of raw breast meat contributed about 27-30% of US recommended daily allowance (USRDA) of B₆ and 53-60% of USRDA of niacin; corresponding values for thigh meat were 13% and 23-28%. There were no significant differences in vitamin content between sexes or between strains. However, there were interactions of strain \times region, strain \times sex, region \times sex, and strain \times region \times sex for each of the vitamins in breast or thigh meat. IFT

159

[Cutting of chicken carcasses into basic parts.]

Isakov, M.; Nedeljkovic, L.; Bogojevic, M.

Tehnologija Mesa 20 (3) 86-88 (1979) [2 ref. Sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

10 individual incisions used in the cutting of chicken carcasses are defined, and 10 cuts (basic parts) are described in detail. The 1977 revision of the Regulations on Meat Quality (1974 and 1975) reflects the present requirements of the market and the potential of the poultry industry in Yugoslavia. STI

160

Chicken flavourings.

Anon.

South African Food Review 7 (2) 29, 31 (1980) [En]

Experiments were carried out to identify problems involved in developing meat flavours. Meat (chicken, beef and pork) broths were made to standard recipes, concentrated to 50% vol. (typical colour components of the meat broths were lost with water vapour), restored to initial vol. with water and evaluated for flavour by a taste panel. Results show beef and chicken broths were largely correctly recognised whereas pork was difficult to classify. Chicken broths were made either from whole birds or necks + backs, TS contents were approx. 1% (flavour intensity increases with increase in

TS contents). Chicken broths prepared from necks + backs were stored at -18°C and flavour ratings, compared to fresh chicken broth, were determined at intervals over 2 months. A fresh broth given 90–100% of the possible attainable score was given a rating of only 50% after 7 wk storage, a broth that initially scored 50% was given a score of only 20% after 4 wk. These observations outline the difficulties in the development of a flavour of this kind. SP

161

[Factors affecting feed protein utilization by broiler chickens.]

Vincze, L.

Agrartudományi Közlemények 38 (3/4) 393–398 (1979) [Hu] [Agrartudományi Egyetem, Keszthely, Hungary]

Examination of the meat of broiler chickens showed that glutamic acid, carbamide, diammonium citrate, ammonium sulphate and their combinations, when given for protein complementation in the feeds, did not affect the fat composition significantly; DM and protein compositions were the same as those of chickens fed control diets without these N supplements. ESK

162

Effects of withdrawal of copper sulphate from the diet of the mature domestic fowl with special reference to production and tissue mineral content. Stevenson, M. H.; Jackson, N.

British Journal of Nutrition 43 (3) 551–559 (1980) [13 ref. En] [Dep. of Agric. for N. Ireland, Newforge Lane, Belfast BT9 5PX]

Cereal-based diets containing 0, 500, 1000 or 1000 mg added Cu/kg were offered, ad lib., to laying hens for 8 wk. All hens were subsequently offered the control diet (no added Cu, 7.5 mg Cu/kg). Hens from each treatment were killed at 0, 2, 4, 6 and 8 wk after removal of the Cu-supplemented diets. After slaughter mean Cu, Zn and Fe concn. of liver were determined. Greatly enhanced liver Cu concn. resulted from feeding the high-Cu diets but this effect was rapidly reversed on removal of added Cu from the diets. Liver Fe concn. showed a less marked but similar effect; Cu added to diets also decreased liver and gizzard wt. but effects were rapidly reversed on removal of added Cu from the diets. SP

163

[Insect-resistant packaging. Resistance of polyethylene, polyvinylidene chloride, polyester, Al and paper laminates to 4 stored products pests.]

Insektensicheres Verfahren. Widerstandsfähigkeit von Verbundfolien aus Polyäthylen, Polyvinylidenchlorid, Polyester, Aluminium und Papier gegen vier vorratsschädliche Insektenarten.

Schmidt, H.-U.; Bauder, V.

Gordian 80 (4) 70–77 (1980) [21 ref. De, en]

The insect resistance of 8 different 2-, 3- and 4- component laminates was tested with a special apparatus against adult forms of 3 stored products beetles (*Rhizopertha dominica*, *Tribolium confusum* and *Oryzaephilus surinamensis*) and large larvae, ready to

pupate, of *Plodia interpunctella*. 7-day tests were carried out at $25 \pm 2^{\circ}\text{C}$ and $70 \pm 5\%$ RH. Tabulated results showed that all the laminates were penetrated 70–100% by *R. dominica*, but only 1 by *O. surinamensis*. In general, the laminates were resistant to invaders but not to penetrators. Smooth laminates were more resistant than folded ones. Results of tests with original and model packages (dried chicken soup, chocolate pudding powder) gave almost identical results as the test apparatus. Reasons for variations in resistance of the various packaging materials are discussed, and some practical suggestions are made (e.g. use of external layers of Al, PVC, polyester or polypropylene). [From En summ.] RM

164

[Residual presence of hexoestrol dicaprylate at the site of injection into pectoral muscle in broilers.]

Ono, H.; Nakama, K.; Tohyama, K.; Imamichi, T.

Bulletin of the Nippon Veterinary and Zootechnical College No. 28, 36–43 (1978) [9 ref. Ja, en] [Dep. of Physiol., Nippon Vet. & Zootech. Coll., Japan]

Growing chickens were injected with 2.5, 5.0, 7.5 or 10 mg hexoestrol dicaprylate in the *pectoralis* muscle and slaughtered 2, 3, 4 or 8 wk after injection. Samples of *pectoralis* and *biceps femoris* muscles, liver, other viscera, head, fat and leg tissue were tested for hexoestrol residues by administration to spayed immature female rats. Tables of results are given. The *pectoralis* muscle was positive for hexoestrol residues 8 wk after injection for the group treated with 10 mg hexoestrol dicaprylate. A few samples of leg and head gave positive results up to 4 wk after injection. It is concluded that the hexoestrol dicaprylate solution remains at the site of injection as oil droplets being absorbed gradually. [From En summ.] AJDW

165

Quality differences in simulated kosher and conventionally processed chicken.

Powers, J. M.; Mast, M. G.

Journal of Food Science 45 (4) 760–764 (1980) [En] [Pennsylvania State Univ., University Park, Pennsylvania 16802, USA]

Under simulated commercial conditions, the quality of kosher and conventionally processed chickens was compared. 3 processing differences occurring with kosher chickens were studied: cold water 'scald', longer mechanical picking time, and 'koshering' (salting) following evisceration. A factorial experiment ($2 \times 2 \times 2$), with 2 variations of scalding, picking and salting was conducted. Kosher chickens absorbed more water during water chilling than did conventionally processed birds. Colour values reflected loss of the yellow epidermal layer for hot-scalded treatments. Shear values for fresh refrigerated birds were approx. the same for kosher and conventionally processed chickens. Lipid oxidation was accelerated on salted skin samples during frozen storage, but not on frozen salted meat samples. Salting decreased the total aerobic plate count; however, kosher and conventional treatments had approx. the same number of coliforms. Skin and meat from carcasses exposed to salt contained significantly more Na than carcasses not exposed to

salt. A taste panel preferred meat from salted birds throughout storage. Higher levels of lipid oxidation were detected by the taste panel on salted skin samples after 8 months frozen storage but not at 2 months' frozen storage. IFT

166

[Organochlorine pesticide residues in chicken meat.]

Spiric, A.; Visacki, V.

Tehnologija Mesa 20 (5) 153-154 (1979) [8 ref. Sh, en] [Jugoslavenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

During the period 1974-1978, samples of domestic and imported chicken meat were examined, for α - and β -HCH, Lindane, DDT, methoxychlor, heptachlor epoxide and HCB. Only 1.8% of samples of domestic origin did not comply with the Yugoslavian regulations on max. permitted quantities of pesticide residues in foods, whereas 68.3% of samples of imported chicken meat (from 4 countries) contained prohibited amounts of residues. These results indicate that, in Yugoslavia, there is a tendency to replace organochlorine pesticides with more readily degradable pesticides. STI

167

Zinc and iodine supplementation for chickens: effects of zinc and iodine supplementation in the cassava-based diets on performance and body composition of broiler chickens.

Phuah, C. H.; Hutagalung, R. I.

Malaysian Agricultural Journal 51 (3) 311-317 (1978) [20 ref. En] [Fac. of Agric., Univ. of Malaya, Pantai Valley, Kuala Lumpur, Malaysia]

An experiment involving 108 chicks was conducted to assess the effects of Zn (0, 25 and 50 p.p.m.) in combination with I (0, 25 and 50 p.p.m.) in diets containing 40% cassava and 17-19% protein on the performance and body composition of broilers. Protein, fat and moisture content of whole carcass were determined. Carcass proteins was significantly ($P < 0.01$) reduced by dietary Zn supplementation, whereas I produced a reverse effect. Carcass fat was significantly ($P < 0.01$) increased by dietary Zn in diets and decreased by added I. There was also a significant ($P < 0.01$) Zn-I interaction effect on both carcass protein and carcass fat contents. AL

168

[Apparatus for heat treatment of chicken carcasses.]

Danchenko, A. A.; Vybornov, V. D.; Kuz'menko, N. P.; Charushnikov, P. P.; Biryukov, G. N. (Sverdlovskii Myasokombinat)

USSR Patent 713 556 (1980) [Ru]

Apparatus for heat treatment of chicken carcasses in water baths has water-distributing funnels with slits and regulating flaps arranged along the baths, pumps for supplying water to the funnels, and systems for heating the water in the bath with temp. regulators. In order to provide uniform treatment conditions, the pumps are fixed to the end walls of the bath, and the funnels are arranged with the slits facing one another, and with their cross sections in the direction of the water flow. W&Co

169

Heptachlor residue accumulation and depletion in broiler chickens.

Wagstaff, D. J.; McDowell, J. R.; Paulin, H. J.

American Journal of Veterinary Research 41 (5) 765-768 (1980) [23 ref. En] [Bureau of Vet. Med., FDA, Beltsville, Maryland 20705, USA]

Broiler chickens were fed, for the first 8 wk of life, a basal diet containing 0, 0.01, 0.03, 0.1 or 0.3 mg heptachlor (HP)/kg. Birds were killed at ages of 1, 2, 4, 8, 10, 12 and 14 wk; samples of muscle, adipose tissue and liver were removed and analysed for HP and its metabolite heptachlor epoxide (HPE). In a related study, chickens were fed a HP-containing diet (0.3 mg HP/kg) for only the 7th wk of life; liver, muscle and adipose tissue samples were obtained on day 0, 1, 4 and 7 of the same wk and analysed for HP and HPE. Results indicated that the levels of HP and HPE varied with HP concn. in the diet, with length of exposure to HP and with the tissue analysed. The ratio between HP and HPE concn. was found to vary with tissue. HP and HPE residues were found in all 3 tissues, highest concn. occurring in adipose tissue. Concn. of residues in adipose tissue increased rapidly during the first 2 wk of feeding the HP-containing diet and reached a plateau after 4 wk; after cessation of exposure to HP at 8 wk of age, residue levels in adipose tissue were reduced to half their peak value in about 4 wk. Residue levels in liver and muscle were more variable than those in adipose tissue. In the adipose tissue of birds fed the HP-containing diet for only the 7th wk of life, residues increased at a steady rate during the wk. JA

170

[Growth changes in morphological and chemical characteristics of muscles in differently reared broilers.]

Vrakin, V. F.; Mironova, G. L.; Naumov, M. P.

Izvestiya Timiryazevskoi Sel'skokhozyaistvennoi Akademii No. 1, 136-144 (1980) [8 ref. Ru, en] [Kafedra Anatomii & Gistologii Sel'skokhoz. Zhivotnykh, TSKhA, Moscow, USSR]

1 group of 72 cockerels and 73 pullets from a cross of White Cornish (line 140) cocks and White Plymouth Rock (line B) hens was reared in cages (CB), while a similar group was reared on deep litter (DB), both groups being fed and managed alike. Detailed dissection and analysis data are tabulated for sub-groups killed at 1, 21, 42 and 63 days of age. At broiler age (63 days), CB birds reached significantly ($P < 0.05$) higher body wt. than the DB birds, 1493 vs. 1245 g for pullets, and 1733 vs. 1533 g for cockerels. Against this background, slaughter yields of groups of 15 were 76.5 and 77.8% for CB and 75.6 and 77.5% for DB; and ratios of edible to inedible parts were correspondingly 2.14 and 2.05:1 vs. 1.81 and 1.8:1. Proportions (as % total musculature) are tabulated for trunk and neck, wing, thigh and shank muscles; and muscle fibre thicknesses are tabulated for breast, *biceps femoris*, *semitendinosus*, and shank muscles, those in CB birds being thicker than those in DB birds. Moisture, protein, fat and tryptophan contents are tabulated for breast, *biceps femoris*, *quadriceps femoris* and shank muscles. In general, the protein characteristics of pectoral muscles were better, and those of pelvic muscles were poorer in CB birds than in DB birds. SKK

1

Development of shape in turkey carcasses.
Swatland, H. J.

Journal of Agricultural Science, UK 93 (1) 1-6 (1979)
[9 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of
Guelph, Guelph, Ontario, Canada]

44 turkeys (both sexes) of 2 genetic strains were drawn at mean wt.-for-age at 2 wk intervals from a flock of 380 birds from hatching to 20 wk post-hatching. Birds were dissected and linear measurements of skeletal units and breast dimensions were compared with keel length using the logarithmic form of Huxley's allometric growth equation [Problems of relative growth (1932), Methuen & Co., London]. Live wt. and wt. of selected muscles were similarly compared with breast muscle wt. Wing bones and the *biceps brachii* muscle grew at approx. the same rate as keel length and breast muscle, resp. However, leg bones and *semitendinosus* and *gastrocnemius* muscles exhibited slower growth than the breast region. Growth of max. breast length and width was closely matched to keel length, but growth in keel depth was much slower. The desirable convexity in breast shape lateral to the keel was considered to be directly proportional to keel depth. Max. meat depth increased at a faster rate than either keel length or depth. AS

2

Characterization of antioxidants responsible for inhibition of warmed-over flavour in retorted turkey.
Einerson, M. A.; Reinecius, G. A.

Journal of Food Processing and Preservation 2 (1)
1-7 (1978) [4 ref. En] [Dep. of Food Sci. & Nutr., Univ. of
Minnesota, St. Paul, Minnesota 55108, USA]

Antioxidant material which was extracted from retorted turkey was partially characterized as to its chemical nature. Fractionation on Sephadex G-50 indicated the active antioxidant material to have a mol. wt. of between 200 and 500. It inhibited O₂ uptake in model systems in concn. as low as 200 p.p.m., indicating strong antioxidant properties. It was not volatile, but did exhibit strong reducing properties similar to those found in reductones, which are known intermediates in the browning reaction. AS

3

Effect of rigor state, aging, and soy protein isolate on quality of turkey rolls.

Bassila-Kardouche, M. K.

Dissertation Abstracts International, B 38 (7) 3110:
Order no. 77-30092, 100pp. (1978) [En] [Purdue Univ.,
West Lafayette, Indiana 47907, USA]

Studies were conducted to evaluate the potential for use of pre-rigor muscle tissue for manufacture of turkey rolls. Effects of added polyphosphates (0.45% of the preparation 'Kena'), mixing time (10 vs. 30 min), ageing time of hot-boned meat and rolls made therefrom (1, 2 or 3 days), proportion of pre-rigor and post-rigor meat, light vs. dark turkey meat and addition of 1, 2 or 3% soy protein on the quality of turkey rolls were investigated. The results show that polyphosphates increased yield and improved flavour, tenderness and acceptability. Mixing for 30 min increased cooking yield, decreased

shear value, and improved tenderness, texture and acceptability as compared to mixing for 10 min. Rigor state significantly influenced shear values of rolls made from dark meat (pre-rigor samples having higher shear values), but not those of rolls made from light meat. Turkey rolls aged for 3 days had the highest cooking yield; samples made from meat previously chilled for 3 days had the lowest and rolls chilled for 1 day the highest shear values. Cooking yield and shear value data showed no advantage in mixing pre- and post-rigor meat. Light meat rolls tended to have higher cooking yields and lower shear values than dark meat rolls. Quality of turkey rolls was significantly improved by addition of 2 or 3% soy protein isolate; effects of added soy protein were greater than effects of rigor state of the meat. AJDW

4

Protein efficiency ratio and amounts of selected nutrients in mechanically deboned meat.

MacNeil, J. H.; Mast, M. G.; Leach, R. M.

Journal of Food Science 44 (5) 1291-1293, 1298 (1979)
[21 ref. En] [Dep. of Food Sci., Pennsylvania State Univ.,
University Park, Pennsylvania 16802, USA]

3 types of mechanically deboned turkey meat (MDTM) were obtained from a Pennsylvania poultry processing plant and studied for nutrient composition. Samples of MDTM included meat from turkey breast cages (protein 15.4%, fat 10.2%, moisture 71.3%), turkey racks (protein 13.4%, fat 17.0%, moisture 67.9%), and turkey backs (protein 13.0%, fat 21.7%, moisture 65.9%). Protein efficiency ratios (PER) were determined on each type, and with and without an antioxidant. Material without an antioxidant resulted in gross errors. Adjusted PER values of MDTM treated with an antioxidant were significantly higher than the 2.50 value for the standard casein diet. Amino acids, fatty acids, caloric content and selected minerals were also measured. IFT

5

[Arizona salmonellosis of turkeys in Hungary. I. History and clinical, pathological and epizootiological data.]

Sari, I.

Magyar Allatorvosok Lapja 34 (9) 605-609 (1979) [Hu,
en, de, ru] [Debreceni Allategészsegügyi Intezet,
Debrecen, Hungary]

See following abstr. for part II.

6

[Arizona salmonellosis of turkeys in Hungary. II. Aetiology and histopathology.]

Sari, I.; Lakatos, M.; Toth, S.; Nemes, Z.; Szeifert, G.
Magyar Allatorvosok Lapja 34 (9) 610-615 (1979)
[12 ref. Hu, en, de, ru] [Debreceni Allategészsegügyi
Intezet, Debrecen, Hungary]

Arizona hinshawii [*Salmonella arizonae*] Group K (018) Ar. 7a, 7b: 1, 2, 6; Z₄, Z₂₃), sometimes accompanied by *S. agona* (Group B, 1, 4, 12; f, g, s) and *S. zanzibar* (Group E₁, 3, 10; k: 1, 5), was detected in turkey chick carcasses showing pathological changes. The main histopathological changes observed are discussed. 25 *S. arizonae* strains were examined for antibiotic sensitivity

and all were found to be sensitive to chloramphenicol, neomycin and oxytetracycline; 18 strains were sensitive and 7 partly sensitive to furazolidone and 1 strains showed furazolidone resistance; 13 strains were sensitive and 12 were resistant to streptomycin. ESK

7

Acceptability of smoked turkey drumsticks with and without nitrite addition.

Olson, V. M.; King, N. A.; Langbehn, J. A.; Stadelman, W. J.

Poultry Science 58 (3) 587-590 (1979) [10 ref. En] [Anim. Sci. Dep., Purdue Univ., W. Lafayette, Indiana 47907, USA]

2 methods of preparing smoked turkey drumsticks were compared as to consumer acceptance. Smoking and cooking methods were the same; however, one brine solution contained nitrite (Product A) and the other did not (Product B). Consumers were asked to rate both products for colour, appearance, flavour, and tenderness as follows: 1 - very good; 2 - good; 3 - fair; 4 - poor. They were also asked: which product do you like best?, which product would you buy?, and what is your opinion on the nitrite-nitrate controversy? Results indicated 65% preferred Product A, 31% Product B, and 4% both products. Results on buying indicated 58% would buy Product A, 28% Product B, 7% both, and 7% neither. Ratings for colour were: Product A 1.6, Product B 2.3 ($P < 0.01$); appearance: Product A 1.8, Product B 2.3 ($P < 0.01$); flavour: Product A 1.8, Product B 2.1 (non-significant); tenderness: Product A 1.8, Product B 2.0 (non-significant). Responses to the nitrite-nitrate question varied greatly from 'needed to prevent food poisoning' to 'against the use of nitrite'. The drumsticks had a 20% shrinkage loss which occurred during smoking and cooking. Drumsticks were priced at \$25.00/cwt, brine cost was \$4.12/cwt, and total cost was \$29.12/cwt for meat and brine. This resulted in an investment of 36.4c/lb of cured-cooked product. AS

8

Effect of food and water deprivation on live-weight shrinkage, eviscerated carcass yield and water absorption during chilling of turkey carcasses.

Salmon, R. E.

British Poultry Science 20 (3) 303-306 (1979) [6 ref. En] [Res. Sta., Res. Branch, Agric. Canada, Swift Current Saskatchewan S9H 3X2, Canada]

The effect of depriving turkeys of food or both food and water for 12 or 24 h prior to slaughter on live-wt. shrinkage, eviscerated carcass yield and water uptake by the carcass during chilling was studied. Deprivation of both food and water more than doubled the live-wt. shrinkage caused by removal of food alone, and deprivation for 24 h doubled the live-wt. shrinkage caused by 12 h. Reduction in eviscerated carcass yield was small (4 g/kg) when only food was removed for 12 h but was increased by deprivation of both food and water or by depriving for 24 h. Carcass wt. gain during chilling in ice and water was not influenced by pre-slaughter treatment. AS

9

Slaughter losses and carcass composition of the medium white turkey.

Salmon, R. E.

British Poultry Science 20 (3) 297-302 (1979) [14 ref. En] [Res. Sta., Res. Branch, Agric. Canada, Swift Current, Saskatchewan S9H 3X2, Canada]

Processing losses, wt. of inedible and edible offals and eviscerated carcass yields were determined for turkeys of each sex of a medium white strain killed at 18 wk of age. Eviscerated carcass yields were comparable with those previously reported for 24-wk-old turkeys of a heavy strain. The yields of skin, meat and bone of individual skeletal components and of the entire carcass were determined and found to be generally similar to the yields reported for turkeys of heavy strains. The crude protein, fat and moisture composition of meat and skin samples and the edible offal components were determined. Tissue samples from females, other than breast meat, contained more fat and less moisture than the corresponding samples from male carcasses. AS

10

[Distribution of *Salmonella* infections among animals, in foods of animal origin and in feeding stuffs in the Federal Republic of Germany including W. Berlin.] Verbreitung der *Salmonella*-Infektionen bei Tieren, tierischen Lebens- und Futtermitteln in der Bundesrepublik Deutschland einschl. Berlin (West). Pietzsch, O.

Bundesgesundheitsblatt 22 (9) 153-175 (1979) [5 ref. De, en] [Robert von Ostertag-Inst. des Bundesgesundheitsamtes, Postfach, 1000 Berlin 33]

In 1977, the year covered by this report, there were 14 848 isolations of *Salmonella* from animals, foods and feeds in the Federal Republic of Germany, comprising 204 different serotypes. In humans there were, > 40 000 isolations, from 232 serotypes. Among the facts arising from the data are the increased numbers of isolations from meat products and sausages, and frequent isolation of *S. hadar* from turkeys. JRR

11

Turkey strains evaluated.

Perenyi, M.; Horn, P.; Ballay, A.

Poultry International 18 (3) 70, 72, 74 (1979) [En, de, it, fr, es] [Kaposvar Agric. Coll., Kaposvar, Hungary]

Comparative studies on the performance and carcass quality of male and female turkeys of 7 commercial hybrids, slaughtered at 12, 14, 16 or 20 wk of age are described. The results show that live wt, oven-ready wt, breast wt. and thigh wt. were significantly influenced by age and sex, males being larger than females, and live wt. and wt. of carcass components increasing with increasing age at slaughter. Slaughter loss % was little affected by the variables studied. Males had higher % thigh and lower % breast than females. The hybrids studied varied little in carcass quality. AJDW

12

[The carry-over of toxic elements into the meat of farm animals.] Zum Carry over von toxischen Elementen in das Fleisch von Nutztieren. Hecht, H.

Fleischwirtschaft 59 (11) 1621, 1624, 1626, 1628-1629; 1693 (1979) [17 ref. De, en] [Bundesanstalt für Fleischforschung, 8650 Kulmbach, Federal Republic of Germany]

This lecture discusses the carry-over or transfer of toxic substances from the feed to foods of animal origin, the aims and methods used to study carry-over of toxic metals (mainly Pb and Cd), and some results of Pb and Cd detn. in the meat, liver and kidneys of beef, pork, lamb, turkey, deer and wild rabbit from metal-polluted and unpolluted areas of Germany. Tabulated results show max. Pb levels of 57 parts/billion (p.p.b.) fresh wt. basis in the meat of domestic animals, 607 p.p.b. in rabbit meat with much higher levels in liver (max. 1510 p.p.b. in lamb and 24 000 p.p.b. in rabbit from polluted area) and in kidneys (804 p.p.b. in lamb, 8353 p.p.b. in rabbit from polluted area); corresponding levels for Cd are max. 14.4 p.p.b. in pork, 17.6 in deer and 17.8 in rabbit meat, 307 p.p.b. in beef and 2950 in rabbit liver, 540 p.p.b. in pork and 23 100 in rabbit kidneys. Results show that toxic metal contents in most meats are considerably below the proposed max. tolerances of 300 p.p.b. for Pb, 100 p.p.b. for Cd, but excessive concn. occur in some offals as a result of carry-over from contaminated feed. RM

13

[Fattening and slaughtering performance of heavy turkeys.] Mast- und Ausschlachtungsergebnis schwerer Puten.

Scholtyssek, S.

Fleischwirtschaft 59 (12) 1820, 1822, 1863 (1979) [3 ref. De] [Univ. Hohenheim, Postfach 106, 1000 Stuttgart 70, Federal Republic of Germany]

600 male BUT T6 turkeys were fed 5 different diets with mean protein contents 27% reducing to 15% for 22 wk, and examined for fattening and slaughter performance (killing-out yield). Tabulated data showed no significant differences between the diets. Mean slaughter wt. was 16.3 kg with 80.2% killing-out yield and a large proportion of breast (total breast portion 52.2%, with 7.0 kg meat, 1.1 kg skin, 1.4 kg bone). There were significant differences between breast and thigh meat with regard to protein and fat contents and Hunter indices, justifying the distinction between white and dark meat. RM

14

[The pair, partial, and multiple correlation between carcass yield and breast conformation indicators in turkeys.]

Kriz, L.; Maca, E.; Lazar, V.

Acta Universitatis Agriculturae Facultas

Agronomica, Brno 24 (4) 677-685 (1976) [13 ref. Cs, ru, en, de]

The relationships between carcass yield, breast dimensions and selected indices of carcass quality in White Board-breasted hybrid, male and female turkeys

were studied by correlation and regression analysis. In the males all the simple partial and multiple correlations were loose and not significant. In female birds there were a number of significant but not very close (simple, partial and multiple) correlations. The closeness of partial and multiple correlations increased with the number of dependent variables, with a concomitant reduction in the differences between the correlation coeff. for a given combination of indices. Of the simple correlation, the closest coeff. was obtained for wt. of breast muscle with carcass yield ($r = 0.32$). The breast dimensions were significantly correlated with carcass yield only in alternatives of the partial and multiple correlations, and only where the breast muscle wt. was included in the correlation. For the breast dimensions, the most significant correlations were obtained for length of the breast bone and breast width, with correlation coeff. $r = 0.39$ to $r = 0.42$. Reasons for the differences between male and female birds are briefly discussed. RM

15

[New draft regulations on poultry meat quality: cutting of turkey carcasses.]

Isakov, M.; Loncar, S.; Nedeljkovic, L.; Bogojevic, M.; Vojinovic, G.

Tehnologija Mesa 20 (2) 50-59 (1979) [14 ref. Sh, sh, en] [Jugoslovenski Inst. za Tehnologiju Mesa, Belgrade, Yugoslavia]

16

Quantitation of formaldehyde resulting from oxidative deterioration of unsaturated fatty acids. Andrews, S. J.

Dissertation Abstracts International, B 40 (2) 659:

Order no. 79-17950, 146pp. (1979) [En] [Univ. of Utah, Salt Lake City, Utah 84112, USA]

Formaldehyde was detected, and determined by GLC, in oxidized pure methyl oleate, methyl linoleate and methyl linolenate standards, and in oxidized lipid extracts from mechanically deboned turkey meat and turkey cluster fat. Unsaturated fatty acids were determined by GLC during oxidation of extracted lipids; linolenic and linoleic acid concn. decreased significantly ($P < 0.005$) in oxidized lipid extracts from turkey cluster fat frozen-stored for 6 months. It is suggested that detn. of the quantity of formaldehyde formed by oxidation of unsaturated fatty acids may be a useful method for assessment of oxidative deterioration of foods. AJDW

17

Oxidative rancidity in stored ground turkey and beef.

Younathan, M. T.; Marjan, Z. M.; Arshad, F. B.

Journal of Food Science 45 (2) 274-275, 278 (1980)

[En] [School of Home Economics, Louisiana State Univ., Baton Rouge, Louisiana 70803, USA]

Oxidative rancidity in stored cooked ground turkey and beef was determined by the thiobarbituric (TBA) test and sensory evaluations. There was an increase in rancidity with storage for all samples; however, beef treated with onion juice or textured vegetable protein showed a slower rate of deterioration. Rancidity in turkey was effectively controlled by hot-water extracts

of eggplant tissue, peels of yellow onions, potatoes, and sweet potatoes, although initial values were high. There were high positive correlations between TBA values and panel scores for cooked ground beef. Panel members were less sensitive to the rancid odour in turkey and failed to give low sensory ratings even though TBA numbers were high. IFT

18

[Meat yields of broiler turkey hybrids in Hungary.]

Perenyi, M.; Suto, Z.

Baromfitenyesztes es Feldolgozas 26 (6) 250-254 (1979) [Hu] [Mezőgazdasági Főiskola, Kaposvár, Hungary]

The wt. of 1200 broiler turkey hybrids, Double Diamond and BUT/7 (300 turkey hens and 300 turkey cocks for each hybrid) were determined at ages of 4, 10, 12, and 14 wk. The results showed that both hybrids reached the required broiler wt. (4.52 kg in Double Diamond and 4.69 kg in BUT/7) at an age of 12 wk. There was no significant difference in the meat yields of birds slaughtered at the 12th and 14th wk of age. At 14 wk of age, BUT/7 had higher oven-ready carcass wt. and carcass yield than Double Diamond. The higher wt. of BUT/7, both at the 12th and 14th wk, were reached with smaller amounts of feed in the hens and with the same amounts in the cocks in comparison with Double Diamond birds. ESK

19

Louis Rich's informal development strategy sets pace in further-processed turkey industry.

Anon.

Food Product Development 13 (10) 54-55 (1979) [En]

The product development method of Louis Rich, Inc., of Ellsworth, Iowa is discussed including idea origination and sensory evaluations. It consists of an informal flexible approach rather than a committee system of evaluating new product proposals. The company, which is the leader in the field of further-processed turkey products, markets some fresh whole turkeys and fresh turkey parts but is developing products through further processing, methods that include cutting, boning, roasting, curing and smoking to produce items other than whole turkeys. Latest products include a line of deli-style meats such as turkey ham, bologna, salami, frankfurters, breakfast sausage and chunk-style turkey pastrami. Made from turkey instead of pork or beef, each product has its own characteristic generic flavour because the company uses natural commercial spices in blending seasonings to produce a flavour akin to a product's pork or beef counterpart. The entire further-processed turkey industry has penetrated about 20% of the potential meat-buying market. VJG

20

The effects of a polymeric nonabsorbable antioxidant on the stability of ground refrigerated turkey meat. [Lecture]

Salminen, S. J.; Branen, A. L.

Kemia-Kemi 6 (12) 762 (1979) [En] [Dep. of Food Chem., Univ. of Helsinki, SF-00710 Helsinki 71, Finland]

Effects of addition of the nonabsorbable antioxidant Poly AO-79 to ground turkey meat were studied using 3 carriers: (i) corn oil, (ii) 95% ethanol or (iii) polysorbate 20/H₂O. Addition of 200 p.p.m. (fat basis) Poly AO-79 in (iii) had the same antioxidant effect as 200 p.p.m. tertiary butylated hydroquinone in (i). Use of Poly AO-79 in (iii) did not cause off-flavour, off-odour or changes in microbial quality of ground turkey meat. Antioxidant ability of Poly AO-79 was increased by using polysorbate 20 as carrier without H₂O. [See FSTA (1980) 12 7A446.] DIH

21

A histological basis for differences in breast meat yield between two strains of white turkeys.

Swatland, H. J.

Journal of Agricultural Science, UK 94 (2) 383-388 (1980) [13 ref. En] [Dep. of Anim. & Poultry Sci., Univ. of Guelph, Guelph, Ontario, Canada]

2 genetic strains of white turkeys were reared together in a large flock under conditions allowing optimal growth from hatching to 20 wk. Birds of both strains followed similar growth curves with males of both strains growing heavier than females. In one strain, however, the yield of breast meat as proportion of live wt. was greater in both males (287 vs. 225 g/kg) and females (276 vs. 201 g/kg). When expressed in ratio to breast width, max. meat depth was greater in the strain which yielded the higher proportion of breast meat. However, with this index of breast plumpness, females scored higher than males in both strains (high yield, 0.45:1.00 vs. 0.37:1.00; low yield 0.33:1.00 vs. 0.31:1.00). In the superficial anterior region of the *pectoralis* muscle in both strains and sexes, there were strong adenosine triphosphatase and weak succinate dehydrogenase reactions in nearly all muscle fibres. Differences in the radial growth of muscle fibres were found between the 2 strains and, by 20 wk, birds of the lower yield strain had reached only 0.85 (males) or 0.82 (females) of the mean diam. attained in birds of the higher yielding strain. AS

22

The distribution of *Mycoplasma meleagridis* in normal turkey carcasses and those affected with air sac disease.

Pritchard, G. C.; Leach, R. H.

Veterinary Record 106 (13) 285-287 (1980) [12 ref. En] [Anim. Health Div., Min. of Agric., Fisheries & Food, Jupiter Road, Norwich, UK]

Studies on the incidence of *Mycoplasma meleagridis* in tissues of turkey carcasses showing air sac disease are described; 31 turkey carcasses, including apparently normal birds as well as those with various degrees of severity of air sac disease, were studied at a processing plant. *M. meleagridis* was isolated from 13 of the carcasses, including some apparently normal carcasses. It was present in air sacs and wing bone cavities, but not muscle tissue. No other *Mycoplasma* spp. were isolated. *M. meleagridis* was also detected in 7 of 50 samples of wing bones from a condemned meat bin at the processing plant. AJDW

23

Influence of ante- and peri-mortem factors on biochemical and physical characteristics of turkey breast muscle.

Hoof, J. van

Veterinary Quarterly 1 (1) 29-36 (1979) [34 ref. En]
[Lab. voor Hygiene & Tech, Fac. der Diergeneeskunde
Rijksuniv. Gent, Wolterslaan 12, B-9000 Ghent,
Belgium]

Physicochemical characteristics of breast muscle of turkeys (i) manually slaughtered on the farm (no transport) without stunning, (ii) manually slaughtered immediately after transportation without stunning, (iii) industrially slaughtered immediately after transportation and electrically stunning (water bath, 24V) and (iv) industrially slaughtered 24 h after transportation (including starvation) and electrical stunning were studied. Mean values for (i)-(iv) were, resp.: shear force, 9.4, 6.8, 5.0 and 4.8 lb; Gofo value 64.0, 74.4, 67.9 and 76.8; moisture content 74.6, 74.9, 74.6 and 74.5%; and water-holding capacity 31.2, 49.9, 41.5 and 55.7%. [This paper is reprinted without change of pagination in *Tijdschrift voor Diergeneeskunde* 104 (2) with an NI summ. on p. 86.] RM

24

Determination of ipronidazole and its principal metabolite in turkey skin and muscle by combined gas chromatography-negative chemical ionization mass spectrometry-stable isotope dilution.

Garland, W. A.; Hodshon, B. J.; Chen, G.; Weiss, G.; Felicito, N. R.; MacDonald, A.

Journal of Agricultural and Food Chemistry 28 (2) 273-277 (1980) [9 ref. En] [Dep. of Biochem. & Drug Metabolism, Hoffmann-La Roche Inc., Nutley, New Jersey, USA]

A GC (gas chromatography)-MS procedure is described which can detect ipronidazole and its metabolite, α,α -dimethyl-1-methyl-5-nitro-1H-imidazole-2-methanol, in turkey skin and muscle at the 2 p.p.b. level. 100 g turkey tissue are processed using the isolation procedure previously developed for the compound's EC-GC regulatory assay. Portions of the resulting benzene solutions are then analysed by GC-MS using selective ion monitoring. Methane is used both as GC carrier gas and negative chemical ionization reagent gas. For detn. of ipronidazole and its metabolite, molecular anions at m/e 169 and 185, resp., are monitored in the GC effluent. Deuterated analogues of ipronidazole and its metabolite are added at the 2 p.p.b. level to the tissue before processing to establish the retention times, extraction efficiencies, mass spectral responses, and chromatographic peak shapes of both ipronidazole and its metabolite. AS

25

Estimating cooking times and meat yields from roasted turkeys.

Berry, J. G.; Stadelman, W. J.; Pratt, D. E.; Sweat, V. E.
Journal of Food Science 45 (3) 629-631 (1980) [En]
[Food Sci. Inst., Purdue Univ., W. Lafayette, Indiana
47907, USA]

160 turkeys equally divided among weights ranging from 3.5 to 11.0 kg were cooked with or without stuffing in covered pans or under Al foil caps. End-point temp. were determined in the breast, thigh, body cavity, and just under the skin. Cooking in a 163°C oven was continued until thigh temp. was 82°C. Meat, bone, and skin wt. were determined on cooked birds. Either thigh or breast can be used to determine end-point temp. In terms of servings of white meat, no particular advantage was found for any of the sizes studied. Recommended cooking times (min/kg) for unstuffed and stuffed turkeys, resp. are: 3.6-5.4 kg, 52.7, 60.6; 5.5-7.3 kg, 49.3, 57.1; 7.4-9.1 kg, 42.2, 48.9; and 9.2-10.9 kg, 42.2, 42.7. IFT

26

Effect of sorbates on microbiological growth in cooked turkey products.

Robach, M. C.; To, E. C.; Meydav, S.; Cook, C. F.
Journal of Food Science 45 (3) 638-640 (1980) [En]
[Monsanto Co., 800 N. Lindbergh Boulevard, St Louis,
Missouri 63166, USA]

Vacuum-packaged oven-roasted whole turkey breasts and sliced turkey breast luncheon meat were processed with and without potassium sorbate or sorbic acid. Through 12 days of accelerated storage at 10°C, use of 0.26% sorbate reduced the psychrotrophic plate count in both products. In the main study conducted under commercial storage conditions of 4°C, addition of 0.12% sorbic acid to the sliced product extended the time to reach 10^7 cells/g from 15 days in the controls to 42 days in the treated product. In oven roasted whole breasts, psychrotrophic counts in the controls were $> 10^8$ cells/cm² after 14 days at 4°C while sorbate pumped and dipped breasts were below that level through the 56-day storage period at 4°C. Organoleptic evaluations indicated no significant differences between control and sorbate-treated products. IFT

27

Automatic weight selector.

Hunter, B.

Poultry International 18 (4) 36, 38, 110-111, 115 (1979)
[En, de, it, es, fr, ja, ar]

Operation of a Chickaway electronic on-line wt.-selection system (manufactured by Autosystems, Huddersfield, UK) at a turkey processing plant in Great Witchingham, Norfolk, UK is discussed. The system comprises a single weighing station controlling 13 drop-off stations. The first drop-off station has priority over the others, and removes carcasses weighing 8.5-9 kg, which are injected with butter and marketed as Golden Norfolk Self-Basting turkeys. The second station removes birds below a pre-set wt. (2.75 kg). Stations 3-12 select 10 carcass classes in 0.45 kg increments, while station 13 removes heavier birds. Information displays present the total number and wt. of turkey carcasses passing through the weighing station, together with counts of birds removed at each drop-off station. The system is capable of wt. selection in 100 g increments. No problems have been experienced in operation of the system at a throughput of 3000 birds/h. AJDW

28

Turkey pieces.

Ratcliffe, P.

Frozen Foods 32 (8) 20 (1979) [En]

Prospects for the marketing of turkey portions and products in the UK are briefly discussed, including the slowness of the market compared with other countries, in-store butchery of turkeys, the supermarket trade, and frozen products. AL

29

Effect of tetracycline supplementation on growth rate, carcass quality and tetracycline residue in different tissues of turkey breeds.

Riad, S.; El-Husseiny, O.; Eissa, A. I.; Morsi, M. K. *Annals of Agricultural Science, Mqshtohor* 10, 257-264 (1978) [10 ref. En, ar] [Dep. of Anim. Production, Fac. of Agric., Cairo Univ., Cairo, Egypt]

Chicks from Bronze and White Holland turkey strains were fed diets containing 30 p.p.m. tetracycline for 6 months. A subsample of each breed was withdrawn from the tetracycline diet 2 wk prior to slaughter, in order to investigate the rate of disappearance of residues from the carcasses. The proportion of edible material was higher in Bronze than in White Holland turkeys in all samples, and was also higher in birds fed a tetracycline-free diet for the 2 wk prior to slaughter. Tetracycline residues were higher in Bronze turkeys (which ate more feed), and residues in both breeds were highest in thigh muscles, followed by liver and breast tissues. Withdrawal of tetracycline 2 wk pre-slaughter reduced the level of residues by about 40%, to 4.7-6.0 µg/100 g and 6.6-7.5 µg/100 g in the thigh muscles of White Holland and Bronze turkeys, resp. JRR

30

[Breakdown of added diphosphate in turkey breast muscle from different meat quality groups.] Abbau von zugesetztem Diphosphat in Brustmuskelfleisch von Schlachtputen unterschiedlicher Fleischqualität. Hoof, J. van; Dezeure-Wallays, B.

Fleischwirtschaft 60 (3) 489-492 (1980) [34 ref. De, en] [Lab. voor Hygiene & Tech. van Eetwaren van dierlijke Oorsprong, Fac. Diergeneeskunde, Rijksuniversiteit Ghent, B-9000 Ghent, Belgium]

The diphosphatase activity and rate of breakdown of added diphosphate were investigated in normal, PSE (pale soft exudative) and DFD (dark firm dry) turkey breast meat. The meat quality was determined via the post mortem changes in pH, Göfo values and water binding capacity. 0.3% P was added to muscle homogenates as $\text{Na}_4\text{P}_2\text{O}_7 + \text{Na}_2\text{H}_2\text{P}_2\text{O}_7$ and determined after 15, 30, 60, 120, 180 and 360 min. Tabulated results confirmed that initial and final pH (pH_{24}) could be used to determine meat quality and significantly affected colour brightness, water binding capacity and the rate of diphosphate breakdown; the rate of breakdown was significantly increased at the higher pH prevailing in DFD meat and reduced at the lower pH in PSE meat. Hydrolysis was complete after 180 min in DFD meat, 360 min in normal or PSE meat (where 0.3 and 7.5% resp. of residual diphosphate was present after 180 min). Differences were attributed to the pH optimum for

diphosphatase activity and suggested that alkaline sarcoplasmic diphosphatase was the predominant form RM

31

Turkeymeat products on the British market.

Murdoch, S.

Poultry International 18 (13) 58, 60, 62, 64 (1979) [En, de, fr, es, it]

The market for processed turkey products in the UK is discussed; approx. 2.8 million birds were marketed in the form of cuts or processed products in 1979, vs. 800 000 in 1976. Products available in the UK include turkey roasts, sausages, fresh portions and cuts, turkey rolls, cured products, turkey loaf, burgers, and crispy turkey fries. AJDW

32

Consumer acceptability of turkey frankfurters with 0, 40 and 100 p.p.m. nitrite.

Sales, C. A.; Bowers, J. A.; Kropf, D.

Journal of Food Science 45 (4) 1060-1061 (1980) [En] [Dep. of Foods & Nutr., Kansas State Univ., Manhattan, Kansas 66506, USA]

Turkey frankfurter formulated with 0, 40 and 100 p.p.m. nitrite were evaluated for colour, flavour, and overall acceptability by a consumer panel and for rancid and cured meat flavour and aroma by a trained panel. In addition, consumer preference was evaluated by determining the number of frankfurters that consumers selected to eat from each of the 8 formulations. Panelists selected more frankfurters with 40 or 100 p.p.m. nitrite than they did frankfurters with 0 p.p.m. nitrite. In a paired comparison of frankfurters with 0 vs. 100 p.p.m. nitrite, more consumers preferred the colour of those containing 100 p.p.m. nitrite. Their preference did not differ for 40 vs. 100 p.p.m. frankfurters. Trained panelists found no significant difference in flavour and aroma of frankfurters containing 40 vs. 100 p.p.m. nitrite, but flavour and aroma of frankfurters containing no nitrite were significantly different from those of frankfurters containing nitrite. Rancid aroma and flavour decreased and cured meat aroma and flavour increased with increasing nitrite concn. Redness (a^+ values) increased with increasing nitrite concn. Samples containing no nitrite were significantly more yellow (b^+ values) than those containing nitrite. IFT

33

Turkey quality improvement.

Buxted Chicken Co.

UK Patent Application 2 030 841A (1980) [En]

The cooking and eating qualities of young turkeys are improved by injecting a stock/fat fraction, obtained by the rendering down of chickens that are too old for eating, into exsanguinated and eviscerated carcasses of young turkeys. IFT

Food Annotated Bibliographies (FABs)

	1969-1979 Price	1980 Price	1981 12 monthly issue Price
1. Application of Reverse Osmosis to Food Processing	□ £10.00	□ £5.00	□ £8.00
2. New Sources of Food Protein	□ £18.00	□ £11.50	□ £18.00
3. Natural and Synthetic Sweeteners	□ £11.00	□ £6.00	□ £9.50
4. Techniques for Analysis of Flavour Volatiles	□ £12.00	□ £7.00	□ £11.00
5. Microwaves in Food Processing	□ £9.50	□ £4.50	□ £8.00
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12. Toxicology of Food Additives	□ £11.00	□ £6.00	□ £9.50
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26. Nitrosamines	□ £9.50	□ £4.50	□ £8.00
27. Content and Analysis of Mercury in Foods	□ £10.00	□ £6.00	□ £9.50
28. Content and Analysis of Lead in Foods	□ £10.00	□ £5.00	□ £8.00
29. Heatable Packs	□ £9.50	□ £4.50	□ £7.50
30. Sulphur Dioxide in Food Products	□ £10.00	□ £5.00	□ £8.00
31. Lactic Acid Bacteria in Beverages and Food	□ £12.00	□ £7.00	□ £11.00
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